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Alaska Department of Fish and Game
Commercial Fisheries Management
and Development Division
P.O. Box 25526
Juneau, Alaska 99802-5526

December 1995

Abundance, Age, Sex, and Size Statistics for Pacific Herring in the Togiak District of Bristol Bay, 1988

by

Katherine A. Rowell

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ABSTRACT

The run biomass of Pacific herring *Clupea harengus pallasi* in the Togiak District of Bristol Bay was monitored for abundance and sampled for age, size, and sex data in 1988. Abundance was assessed by department staff flying aerial surveys from chartered aircraft. Commercial catch samples were collected from purse seine and gillnet landings. During closed fishing periods, herring samples were obtained from test fish catches made by volunteers from the commercial fleet and by department staff using variable-mesh gillnets. The total run biomass was estimated to be 122,144 tonnes, the greatest biomass documented since 1983. Aerial surveyors documented herring spawning along a total of 101.9 linear km of shoreline. The total sac roe harvest was 12,853 tonnes. Purse seine vessels accounted for 73.9% of the harvest; the remainder was taken by gillnet vessels. After the spawning season 1,818 tonnes of Togiak herring were harvested within the Dutch Harbor food/bait fishery, and an additional 1,421 tonnes were taken as bycatch during the South Unimak trawl fishery. About 13.4% of the run biomass was harvested during 1988, well within the 20% guideline specified by the existing management plan. A total of 5,407 herring were sampled during the 1988 season. The 1977, 1978, and 1979 year classes (ages 9, 10, and 11) composed 71.3% of the total run biomass. The mean weight of herring in the total biomass was 318 g.

KEY WORDS: Pacific herring, *Clupea harengus pallasi*, sac roe, spawning biomass, commercial herring fishery, Bristol Bay, Togiak District, age, length, weight, sex

INTRODUCTION

Pacific herring *Clupea harengus pallasi* are harvested in several spawning locations along the eastern Bering Sea coast from Norton Sound south to Port Moller. The Togiak District of Bristol Bay supports the largest discrete spawning biomass of Pacific herring in the eastern Bering Sea and in Alaskan waters. Biomass estimates based on aerial surveys have been conducted since 1978. These estimates of the Togiak run biomass have ranged from 69,818 tonnes (76,960 tons) in 1980 to 219,810 tonnes (242,298 tons) in 1979 (Table 1). From 1984 through 1987, the Togiak herring run biomass has accounted for 70% of the total documented run biomass of herring assessed for the entire eastern Bering Sea coast (Lebida et. al. 1985b, 1986; Lebida and Sandone 1988; Lebida 1987).

Herring spawn within the Togiak District from late April to the end of May. After spawning the herring leave the fishing district and migrate south, in a clockwise direction along the Alaska Peninsula to feeding areas near Unalaska Island. In August and September the herring move from feeding areas to overwintering grounds near the Pribilof Islands (Shaboneev 1960; Wespestad and Barton 1981; Funk 1990; Figure 1).

The largest fishery for Togiak herring occurs during their inshore spawning period. The most valuable product from this harvest is the ripened ovaries or egg skein, which is referred to as *sac roe* and is primarily marketed in Japan. Commercial harvest of herring for sac roe was first documented in the Togiak District in 1968. Passage of the Fisheries Conservation and Management Act in 1976 and the resulting inability of Japanese fishermen to harvest sac roe from U.S. waters prompted increased interest in the Togiak fishery by U.S. fishermen. The harvest has been divided between purse seine and gillnet gear. The average annual harvest through 1987 was 15,164 tonnes (16,715 tons). The greatest harvest of 22,092 tonnes (24,352 tons) was caught during the 1983 season (Table 1).

Brown algae *Fucus* sp, commonly known as rockweed, on which herring have spawned is also harvested within the Togiak District. This spawn-on-wild-kelp product is harvested either by hand or rake, primarily by local residents. The harvest, documented since 1967, has increased in recent years (Table 1). Average annual harvest since 1978 has been 132 tonnes (146 tons).

During their post-spawning migration Togiak herring have been intercepted by other fisheries. A directed food/bait fishery has occurred during mid to late summer months in the Unalaska Island area. Catches were first documented on these feeding herring in 1929. Harvests reached a maximum of 2,727 tonnes (3,006 tons) in 1932. The fishery declined and ended completely by 1938 due to poor market demand but was renewed in 1981. The annual harvest since 1981 has averaged 2,565 tonnes (2,827 tons; Table 1).

Incidental harvest of Togiak herring has occurred as bycatch in fisheries targeting groundfish in the southeastern Bering Sea. These groundfish fisheries were first exploited by foreign vessels but more recently have been dominated by domestic fishers. These fisheries often occur along the migratory route of feeding herring (Funk 1990; Rowell et al. 1991). The additional harvest upon a fully exploited herring population has been a concern brought before the North Pacific Fishery Management Council and the Alaska Board of Fisheries by western Alaska fishermen.

Togiak herring are managed as a single spawning population distinct from others in the Bering Sea. A maximum regulatory exploitation rate of 20% of the spawning biomass is set by the Bristol Bay Herring Management Plan, 5 AAC 27.865 (ADF&G 1988). This plan provides an allocation of 1,361 tonnes (1,500 tons) for the spawn-on-wild-kelp fishery and 7% of the remaining harvest allocation after subtraction of the spawn-on-kelp allocation for the Dutch Harbor food/bait fishery. The rest of the harvestable surplus is reserved for the sac roe fishery: 25% for the gillnet and 75% for the purse seine fleet.

Stock assessment studies of the Togiak herring population began in 1976 and have been documented annually since 1978 (McBride et al. 1981; McBride and Whitmore 1981; Fried et al. 1982a, 1982b, 1983a, 1983b, 1984; Lebida et al. 1985a, 1985b; Lebida 1987; Lebida and Sandone 1988). As in past years the objective of this year's work was to document the age, size, and sex composition, as well as maturity of the commercial harvest and to estimate run biomass and the spawning escapement of herring in the Togiak District. These data provide the basis for development of population and forecasting models used to determine harvest strategies. While past documents have included data for all eastern Bering Sea spawning and fishing locations north of Port Moller, this report contains data only for the Togiak District.

METHODS

Study Area

The Togiak District is one of five fishing districts within Bristol Bay Management Area T. The district consists of all state waters between the longitude of the tip of Cape Constantine and the longitude of the tip of Cape Newenham, a linear distance of approximately 193.2 km (120 miles; Figure 2). Because of its large size, the Togiak Fishing District is divided into six management sections (Kulukak, Nunavachak, Togiak, Hagemeister, Pyrite Point, and Cape Newenham).

The shoreline is characterized by a wide intertidal zone and several shallow bays. Diurnal tidal range may reach 4.6 m (Selkregg 1976). Ribbon kelp *Laminaria*, rockweed *Fucus*, and eelgrass *Zostera* are the primary marine vegetation observed in the Togiak District. The spawn-on-wild-kelp fishery has focused on the harvest of rockweed, primarily in the Togiak, Nunavachak, and Kulukak Sections. Herring have spawned throughout the fishing district, particularly in areas where eelgrass and rockweed have been present. Rockweed is the most visible species because it grows on cobble substrate located within the intertidal area and upon rocky outcroppings.

Herring are harvested for sac roe by gillnet and purse seine gear. During the 1988 fishing season gillnet gear could only be fished in the Kulukak and Nunavachak Sections, whereas purse seine gear could only be fished in the Togiak, Hagemeister, Pyrite Point, and Cape Newenham Sections (5 AAC 27.830; ADF&G 1988). This regulation provided parity for each gear group and allowed the department to manage the fishery in an orderly manner.

Age, Weight, Length, and Sex Data

Data Collection

Pacific herring were collected from management sections within the fishing district during fishery openings and closures. During closed fishing periods, volunteer commercial fishers made test purse seine and gillnet sets to capture herring in each fishing section throughout the spawning migration. Alaska Department of Fish and Game (ADF&G) crews fished variable-mesh gillnets if commercial purse seine vessels were not available to capture herring during closed periods in a given section. These gillnets were assumed to be nonselective so that catches would represent the entire size and age spectrum of the biomass. Variable-mesh gillnets were 30.4 m (100 ft) in length, consisting of four 7.6-m panels, each with a different mesh size. Panels were arranged by increasing order of stretch mesh size of 38 mm (1.5 in), 51 mm (2.0 in), 64 mm (2.5 in), and 76 mm (3.0 in).

Herring were also sampled at the close of each commercial fishing period from tenders or individual fishing vessels for each gear type and fishing section. Crews were instructed to collect samples from a minimum of five vessels for each gear type within each management section to ensure samples were collected from more than one school.

Sex was determined and gonad maturity was observed for each herring through examination of the gonads or sex products. Maturity of female herring was rated by the eight-scale guideline outlined in Barton and Steinhoff (1980) for females. These categories were combined and reported as green, ripe, and spent. Maturity of male herring was categorized as ripe and spent.

Standard length from the snout to the hypural plate at the base of the tail for each fish was measured to the nearest millimeter with an accuracy of 0.5 cm. The location of the hypural plate edge was defined by the crease formed when the tail was bent upward. Each herring was weighed to the nearest gram on a dialamatic balance. A scale for age determination was removed from the left side of each fish from approximately 2.5 cm behind the operculum and 2.5 cm below the lateral line. If scales were absent from this preferred area, the secondary areas of selection were the preferred area on the right side of the fish, and finally, anywhere a readable scale was present. Removed scales were dipped in 10% mucilage solution, mounted sculptured-side-up on glass slides, and read by annuli interpretation using a microfiche reader (magnification 60x). Herring spawning in the Bering Sea form an annulus at the end of winter (Shaboneev 1965). This timing was coincidental to the collection of samples in the spawning migration; thus, the outer edge of the scale was counted as an annulus.

Sample Sizes

The sampling goal was a minimum of 210 Pacific herring per sampling strata (Cochran 1977; Fried et al. 1984). Where N is sample size, a is tolerable absolute error (0.10), r is fraction of the sample corresponding to the year class of interest (0.5), Z is upper 100 $(100)(1-\alpha)(2^{-1})(k^{-1})$, a percentage point of the standard normal distribution, where α is probability of a Type I error (0.05) and k is number of year classes (7) in the sample, so that

$$N = \frac{Z^2 r(1-r)}{a^2}. \quad (1)$$

Sampling strata were defined by gear type, a 7-d sampling week, and by management section.

To estimate the age, size, and sex composition of the commercial catch, 210 herring were collected from each commercial gear type. The same 210-fish sampling goal was used for all gear-specific experimental gillnet or purse seine test fish samples for each weekly sampling strata.

The sampling time per strata, because of the compressed nature of the 1988 run, was shortened to ensure collection of an adequate number of samples to represent the age composition during the period the peak biomass was present in the district. Therefore, a revised daily sampling goal of 100 herring from any nonselective gear (i.e., purse seine or variable-mesh gillnet), was established for each management section to ensure that run biomass was adequately represented. The goal was based on the number of fish that could be processed each day by personnel stationed in each of the three field camps.

Samples from adjacent fishing sections or sequential sampling days were later pooled when necessary to attain adequate sample sizes for estimating the age composition of the run biomass. The desired sample size of a multinomial population would result in an estimate that would simultaneously fall within 5% ($\alpha = 0.05$) of the true population age proportions 95% of the time (Thompson 1987). The sample size of 405 herring would guarantee this level of precision for the number of age classes represented with consideration of 10 age classes (ages 3–12).

Age, Weight, and Length Data

Age composition of the commercial harvest and total run biomass were estimated from herring collected from the commercial and test fisheries throughout the Togiak District. Only samples captured by nonselective gear (variable-mesh gillnet, purse seine, or dip net) were used to determine age structure of the population and run biomass.

The percent age composition by number for each age class, P_a, was estimated for samples from each gear-time-area stratum for samples from both fishery and nonfishery samples:

$$P_a = \frac{n_a}{n}, \quad (2)$$

where n_a is the number of herring in the sample that were age a and n is the total number of herring in the sample.

The mean weight-at-age, W_{ai}, for herring was estimated for each gear-time-fishery stratum by

$$\overline{W}_a = \frac{\sum_{i=1}^{n_a} W_{ai}}{n_a}, \qquad (3)$$

where W_{ai} is the individual weight of herring in the sample n that were age a.

The mean length-at-age was calculated by substituting the individual length L_{ai} of herring for the individual weight W_{ai}. Length- and weight-by-age data from nonselective gear types (purse seine, variable-mesh gillnet) were pooled to represent the mean length and weight of the entire population. Mean length- and weight-at-age were graphed for specific ages against time to detect any changes in size throughout the duration of the run.

Commercial Harvest

Fish tickets (sales receipts) were completed by processing companies and buyers for each commercial delivery of herring and spawn on kelp. Copies of all tickets were returned to ADF&G where staff then edited and entered the information into a database. The database was reverified against each fish ticket. Harvest data by product, gear type, harvest date, and fishing section were summarized for the 1988 season. Estimates of wastage were obtained from recovery of herring from abandoned gillnets and from aerial estimates of discarded herring. Estimated wastage was included in the fish ticket database and used in the calculation of exploitation rates. Harvest statistics presented in this report are the final verified statistics for the 1988 season.

Herring in the Togiak District are also harvested for subsistence use primarily by local village residents. The subsistence harvest for sac roe and spawn on wild kelp has been very small and has not been monitored on an annual basis (J. Skrade, ADF&G, Dillingham, personal communication).

Herring bycatch in groundfish harvests near Unalaska Island and Unimak Pass was reported voluntarily on fish tickets. Most herring bycatch was assumed to be Togiak herring because these fisheries occurred in areas along the migration route used by feeding Togiak herring. Documented fish ticket data were used to calculate monthly bycatch harvest rates in the fishing area. The total herring bycatch was estimated by using these rates (L. Watson, ADF&G, Kodiak, personal communication).

The weight of the spawn on wild kelp harvested was converted to the equivalent number of adult herring required to deposit the quantity of eggs harvested (ADF&G 1989). While herring that deposited the harvested spawn on kelp were not removed from the biomass, this spawn-on-wild-kelp biomass was included in the calculation of exploitation rates as set forth under the Bristol Bay Herring Management Plan (see 5 AAC 27.185 in ADF&G 1988).

Biomass Estimation

The herring run biomass for the Togiak District was estimated using aerial survey assessment procedures outlined by Lebida and Whitmore (1985). Aerial surveys were flown daily, weather permitting, at low tide to estimate herring abundance. Each management section was divided into index areas to facilitate survey documentation. Aerial survey estimates for each index area were summed to provide biomass estimates for each management section by day. Biomass estimates for all management sections were then summed to provide the observed districtwide biomass for each day.

The migration of herring between management sections within the Togiak District is not well understood. Residence time of herring within the district or rate of turnover for the biomass on the grounds is unknown. Age and maturity data from the herring samples that had been collected by nonselective gear were pooled across management sections to determine any temporal trends in age composition or maturity for the entire fishing district that would indicate immigration of new herring into or emigration of spent herring out of the fishing district.

Age composition by weight of both the commercial harvest and of the appropriate daily biomass data for each age class was estimated by

$$B_a = \left[\frac{n_a \overline{W}_a}{\sum_{a=1}^{\max_a} (n_a \overline{W}_a)} \right] B, \tag{4}$$

Where B_a is the biomass for age a, n_a is the number of herring in the sample that were age a, $\overline{W}_a$ is the mean weight for herring of age a, and B is the total estimated harvest expressed as biomass or daily biomass estimate.

Age composition of the waste or deadloss (i.e., herring that were caught but not sold) was represented by the age composition for the same gear type in the commercial fishery.

The composition by age and in numbers of fish, N_a, for each component was then calculated by

$$N_a = \frac{B_a}{\overline{W}_a}, \tag{5}$$

Where N_a is the total number of herring in age class a, B_a is the biomass for herring age a, and $\overline{W}_a$ is the mean weight of the fish at age a.

The run biomass, B_{tot}, was calculated from the daily biomass estimates by summing the biomass by each age class and management section from the two surveys that corresponded with changes in the age composition and gonad maturity data. To prevent double counting of herring, the biomass by age of herring age 6 and older observed during the first peak survey biomass estimate B_{a1} was added to the age 5 and younger component of the second peak estimate B_{a2},

$$B_{tot} = B_{a1} + B_{a2}. \tag{6}$$

The inshore escapement biomass, E_{tot}, is the summation of the difference between the run biomass, C_a, for each age and the combined purse seine and gillnet harvest for each age C_a:

$$E_{tot} = \sum (B_a - C_a). \tag{7}$$

Exploitation Rates

The overall exploitation rate, E_t, was calculated by dividing the sum of all sources of exploitation or harvest, C_i, for the 1988 season by the 1988 revised total run biomass estimate, B_{tot}, or

$$E_{tot} = \frac{\sum_{i=1}^{n_i} C}{B_{tot}}. \tag{8}$$

The spring fishery exploitation rate was calculated using only the commercial sac roe harvest and the spawn-on-wild-kelp biomass.

RESULTS

Age, Weight, Length, and Sex Data

Biological data were collected from 5,407 herring collected in the Togiak Fishing District (Table 2) by purse seine, commercial gillnet, variable-mesh gillnet, and dip net from 1 May through 25 May 1988. Regenerated or unreadable scales composed 12.8% of all scale samples. The percentage of unreadable scales was similar for commercial gillnet (16.0%), test gillnet (15.7%), and commercial purse seine (15.7%) samples. Variable-mesh gillnet samples had the smallest percentage of unreadable scales

(10.4%). Readability of herring scales is dependent on the location of the body from which the scales have been removed as well as regeneration caused by scale loss. Because the opportunity for injury or scale loss would probably increase as herring grow older, the proportion of unreadable scales would be expected to increase with increasing age and size. However, mean lengths for unaged samples were similar to those for the aged samples (NSC), indicating that readable scales were representative of the entire sample.

Herring ages 3–14 were present in both the total run biomass and commercial harvest. The temporal change in age class structure of the population was evident in the age composition of collected samples (Table 3; Figure 3). The proportion of herring aged 9 and older composed 71% of the samples collected from nonselective gear during the early sampling period 12–14 May and decreased steadily to 18% by 24–25 May. Conversely, the proportion of age-3, -4, and -5 herring present in the samples increased from 6% during 12–14 May and increased gradually to 59% by 24–25 May. The proportion of aged 6–8 herring collected in the samples did not show a temporal trend and ranged between 22% and 24% of the samples for each sampling period throughout the season (Table 3).

Mature herring ranged in weight from 90 g (age 4) to 608 g (age 14) and in length from 200 mm (age 4) to 340 mm (age 10; Appendix A). Differences were not evident (NSC) in the graphical comparison of mean length-at-age for samples representing the run biomass, commercial gillnet harvest, and purse seine harvest (Table 4; Figure 4). Graphical depiction of length through time did not reveal an apparent increase or decrease in length for each age represented.

Differences were not apparent (NSC) between mean weight-at-age herring samples representing the commercial purse seine fishery and run biomass. Mean weight-at-age of the gillnet samples was slightly larger than the other two groups at the earlier ages and smaller at the older ages (Table 3; Figure 3). The high variability for the weight-at-age data is a result of the collection of herring at stages of gonad maturity ranging from fully mature to spent.

Graphical representation of mean weight-at-age from herring collected by nonselective gear shows a slight decrease in weight by age over the duration of the sampling period. Because ripe herring were present throughout the season, this decrease cannot be attributed to collection of spawned-out herring toward the later portion of the season.

The ratio of males to females fluctuated considerably in the daily samples for each gear type without any noticeable trend. Sex ratios were 1:0.9 for commercial purse seine, commercial gillnet, or variable-mesh gillnet samples. Test commercial purse seine and gillnet samples exhibited sex ratios of 1:1 (Appendix A).

Commercial Harvest

A total harvest of 12,853 tonnes (14,168 tons) was landed within the Togiak District for sac roe (Table 5). The purse seine fleet caught 9,500 tonnes (10,472 tons), which was 73.9% of the inshore

harvest. The gillnet fleet caught 3,353 tonnes (3,696 tons), which was 26.1% of the catch (Figure 7). Wastage for both gear types totaled 268 tonnes (295 tons).

Seventy-seven percent of the purse seine harvest was taken in the Hagemeister Management Section, and 70.4% of the gillnet harvest was taken from the Nunavachak Management Section. The combined roe percent of herring caught by both gear types was 10.5%. The spawn-on-wild-kelp harvest totaled 222 tonnes (245 tons); the resulting spawn-on-kelp biomass was 1,583 tonnes (1,745 tons).

Sample sizes of herring collected for age-composition analysis of the purse seine catch were below the desired goals (Table 6). Herring age 9 and older composed 75.4% of the seine harvest (Table 7). Age groups 6–8 contributed 19.6% and age 5 and younger 3.6% of the harvest (Table 7; Figure 8).

Herring age 9 and older represented 83.3% of the gillnet harvest, whereas the age 6–8 component composed 16.6% of the harvest (Figure 8). Herring in the age 5 and younger category were not present in the gillnet catch samples. The gillnet harvest was restricted to the Nunavachak and Kulukak Sections. Desired sample sizes were not attained for the two management sections in which the gillnet harvest occurred and were therefore combined to represent age composition of the gillnet harvest. Samples were collected from fishermen fishing gillnets with mesh sizes of 70 mm (2.75 in) and 76 mm (3.0 in).

Age composition of gillnet fishery samples was significantly different ($p \leq 0.05$) than age composition in the purse seine fishery (Table 4). This difference was most clearly reflected in the mean size of the herring caught. The average weight of gillnet-caught herring of 374 g was greater than the average weight (360 g) of purse seine-caught herring (Table 4).

Biomass Estimation

Small volumes, <10 tonnes, of herring were first observed in the Togiak District on 8 May (Table 8). The first substantial biomass of 1,606 tonnes (1,770 tons) was observed on 12 May. The biomass continued to increase and reached a peak of 116,652 tonnes (128,597 tons) on 16 May. Approximately 80–90% of the herring sampled on 16 May were in ripe or spawning condition (Appendix B). Most of the biomass was concentrated in the Togiak and Hagemeister Sections.

The biomass observed 19 May decreased to 24,246 tonnes (26,276 tons), representing primarily spent herring. The biomass again increased to 35,745 tonnes (39,402 tons) on 21 May. Corresponding age data indicated the first peak in the sequence of biomass observations by number was 71% of herring age 9 or older (Table 3). The contribution of age 9 and older herring then decreased to 59% and the percentage of herring ages 3–6 increased to 17%. Data for the second observed biomass peak on 22 May show age 9 and older fish again decreased to 32% and ages 3–5 increased considerably to 44%. Gonad indices showed an increase in ripe herring at the time of this later survey, indicating an influx of new, prespawning herring into the fishing district. The final revised biomass estimate consisted of the sum biomass estimate representative of ages 6 and older on the peak 16 May (114,066 tonnes; Table 9) and the biomass of age-3 to -5 herring observed 22 May (6,718 tonnes; Table 10). This sum produced a run

biomass estimate of 122,144 tonnes (134,639 tons), equivalent to 359 million herring (Table 11). After removal of the commercial sac roe harvest, the spawning escapement totaled 109,291 tonnes (120,471 tons; Table 7).

A biomass of 18,123 tonnes in the western portion of the Hagemeister, Pyrite Point, and Cape Newenham Sections was observed moving in a westerly direction toward the fishing district boundary on 16 May (R. Russell, ADF&G, King Salmon, personal communication). These migrating herring were included in the biomass estimate for the Togiak District for that day.

Miles of spawn for 1988 totaled 102.0 km for all fishing sections. Peak spawning was documented 17 May with observation of 36.6 km of spawn or milt.

Herring age 9 and older represented 75.6% of the biomass and 64.4% of the population in the final weighted age composition (Table 6). The strong 1977 and 1978 year classes appearing as age-10 and -11 herring in 1988, composed 54.2% of the total run biomass and 45.9% of the total population (Figure 6). The 1979 year class, age 9, and the 1981 age class, age 7, were also abundant, contributing 17.1% and 11.9%, respectively, to the total run biomass. Newly recruited herring, age 5 and younger, represented only 6.7% of the biomass and 15.3% of the population.

Exploitation Rates

The spring sac roe and spawn-on-wild-kelp fishery accounted for a total removal of 13,075 tonnes (14,413 tons) of herring and a spring fishery exploitation rate of 10.7%. An estimated 1,818 tonnes (2,004 tons) were harvested in the Dutch Harbor food/bait fishery (ADF&G 1991), and an additional 1,421 tonnes (1,566 tons) were taken as bycatch from the Unimak Pass trawl fishery (L. Watson, ADF&G, Kodiak, personal communication). This offshore component represented a removal of 1.6% of the estimated Togiak run biomass. The total harvest by all fisheries totaled 14,893 tonnes (16,416 tons), resulting in an overall exploitation rate of 13.4%.

DISCUSSION

The 1988 Togiak District run biomass estimate of 122,144 tonnes (134,639 tons) was the greatest abundance of herring documented since 1983. The estimated run biomass for all herring fishing districts monitored in the eastern Bering Sea was 181,158 tonnes (199,690 tons; ADF&G 1991; Hamner 1988). Togiak herring compose the largest component (67.4%) of the entire eastern Bering Sea herring biomass (Figure 9). Age-10 and -11 herring dominated the Togiak biomass, whereas 15.3% of the herring population were age 5 and younger (Table 7). The ability to document this large abundance of Togiak herring during the 1988 season was attributed to good visibility and water clarity due to excellent weather conditions rather than recruitment.

Sample sizes of herring collected by nonselective gear were not large enough for comparison that would provide insight into movement of herring between management sections or residence time. This is the first season ADF&G surveyors observed herring migrating toward the western boundary of the fishing district. Anecdotal reports have suggested that some mature herring move west through the Togiak District, pass Cape Newenham, and then proceed into Kuskokwim Bay to spawn. Evidence substantiating any migration from the Togiak District into Kuskokwim Bay has yet to be documented.

Temporal changes in age composition were distinct during the 1988 season and were consistent with changes observed in previous years (McBride et al. 1981; Fried et al. 1982a, 1982b, 1983b, 1984). Mean weight-at-age was also greater at the beginning of the season, suggesting a better roe recovery at age for herring caught earlier. Focusing the commercial fishery on the beginning of the herring run provides for the harvest of older, larger herring. This is desirable policy because older herring not only experience decreasing survival rates due to increased age (Fried and Wespestad 1985; Baker 1991) but also have greater roe recovery due to their larger size (Brannian and Rowell 1991).

The total 1988 overall exploitation rate of 13.4%, which included the sac roe, spawn-on-kelp, the Dutch Harbor food/bait, and Unimak trawl harvest was within the 20% guideline specified by the Bristol Bay Fisheries Management Plan. The incidental harvest of herring in the trawl fisheries was probably underreported, indicating this exploitation rate is an underestimate.

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Table 1. Historical run biomass and commercial harvests of Pacific herring returning to the Togiak District, 1968–1987.

Year	Total Run Biomass (tonnes) [a, b]	Togiak Sac Roe Harvest (tonnes) [c]	Spawn-on-Kelp Harvest (tonnes) [d]	Dutch Harbor Food/Bait Harvest (tonnes) [e]
1968		73		
1969		43	5	
1970		25	18	
1971		[f]	23	
1972		73	29	
1973		46	5	
1974		112	57	
1975		51	50	
1976		[a]	134	
1977		2,536	125	
1978	173,761	7,016	150	
1979	219,810	10,485	188	
1980	69,818	20,219	86	
1981	144,117	10,300	172	639
1982	88,925	17,996	107	3,234
1983	127,962	22,092	125	3,236
1984	102,940	16,015	184	3,246
1985	120,131	21,288	[f]	3,157
1986	85,630	13,423	170	2,172
1987	80,818	12,807	139	2,271
Mean	121,391	15,164	132	2,565 [g]

[a] Data not available prior to 1978.

[b] Source: Brannian and Rowell 1989.

[c] Source: Sandone and Brannian 1988, 1980–1987; ADF&G 1988, 1968–1979.

[e] Source: ADF&G 1991; catches documented since 1929. Fishery did not occur between 1946 and 1980.

[f] No fishery conducted.

[g] Mean calculated for total run biomass; sac roe and spawn-on-kelp harvests are years 1978–1987; Dutch Harbor food/bait fishery for years 1983–1987.

Table 2. Number of samples collected by gear type during the 1988 Togiak herring season.

	Number of Readable Samples	Number of Unreadable Samples	Total	Percent Unreadable
Commercial Purse Seine	634	118	752	15.7
Commercial Gillnet	353	67	420	16.0
Test Commercial Purse Seine	2,309	314	2,623	12.0
Test Commercial Gillnet	409	76	485	15.7
Test Variable-Mesh Gillnet	969	113	1,082	10.4
Test Dip Net	40	5	45	11.1
	4,714	693	5,407	12.8

Table 3. Unweighted percent age composition, through time, of samples collected from nonselective gear in the Togiak District, 1988.

Sample Size	Date	Age Groups 3–5	6–8	9+ [a]
156	5/01–5/11	23%	43%	34%
656	5/12–5/14	6%	23%	71%
819	5/15–5/17	6%	23%	71%
564	5/18–5/20	17%	24%	59%
1,048	5/21–5/23	44%	24%	32%
174	5/24–5/25	59%	23%	18%

[a] Includes ages 9–15.

Table 4. Mean length and weight and standard deviation by age for collected herring representative of the total run biomass and of the commercial harvest by gear type, Togiak District, 1988.

Run Biomass [a]						Commercial Purse Seine						Commercial Gillnet					
Age	Number of Samples	Length (mm)	SD	Weight (g)	SD	Age	Number of Samples	Length (mm)	SD	Weight (g)	SD	Age	Number of Samples	Length (mm)	SD	Weight (g)	SD
3	3	214	5.4	110	8.6	3						3					
4	260	223	11.1	135	29.2	4	6	228	10.6	153	30.6	4					
5	565	242	10.5	177	30.5	5	43	250	8.7	205	35.9	5					
6	108	259	12.3	226	42.2	6	13	257	16.9	230	42.4	6					
7	615	274	9.9	281	48.4	7	100	277	8.3	294	38.9	7	45	271	8.3	310	37.2
8	227	285	11.1	324	54.8	8	38	286	7.1	339	43.2	8	23	288	8.3	346	42.8
9	591	295	11.5	369	60.6	9	105	294	8.9	368	48.5	9	90	298	9.9	371	48.7
10	964	302	10.2	393	62.0	10	223	301	9.0	401	50.3	10	153	303	9.6	388	44.2
11	471	307	9.5	415	65.6	11	90	306	9.0	423	53.4	11	35	310	7.1	407	44.0
12	63	314	9.2	459	65.6	12	13	310	10.2	444	67.0	12	6	313	9.8	423	55.4
13	33	317	9.5	437	76.8	13	2	318	5.7	489	75.0	13	1	320		422	
14	11	324	11.3	508	73.6	14	1	330		494		14					
Total	3,911	281	28.7	318	109.5		634	291	19.3	360	81.8		353	299	12.9	374	62.7

[a] Collected from nonselective gear, including commercial purse seine, test purse seine, and variable-mesh gillnets.

Table 5. Commercial purse seine and gillnet harvests by fishing section and date, Togiak District, 1988. Roe percentages are listed in parentheses.

Date	Hours Fished	Fishing Section						Total (tons)	Total (tonnes)
		Kulukak	Nunuvachak	Togiak	Hagemeister	Pyrite Point	Cape Newenham		
Gillnet									
5/17	4.0	1,095 (15.9)	2,455 (13.6) [a]					3,551 (12.1)	3,221
5/17 [b]			145					145	132
	4.0	1,095 (15.9)	2,600 (13.6)					3,696 (12.1)	3,353
Purse Seine									
5/17	0.5			194 (8.5)	8,099 (11.9)	1,296 (11.3)	721 (11.4)	10,310 (11.7)	9,353
5/17 [c]				150				150	136
5/24 [d]			12 (9.1)					12 (9.1)	11
	0.5		12 (9.1)	344 (8.5)	8,099 (11.9)	1,296 (11.3)	721 (11.4)	10,472 (11.7)	9,500
Combined Gear									
5/17	4.5	1,095 (15.9)	2,600 (13.6)	194 (8.5)	8,099 (11.9)	1,296 (11.3)	721 (11.4)	13,861 (11.9)	12,575
5/17			145	150				295	267
5/24			12 (9.1)					12 (9.1)	11
	4.5	1,095 (15.9)	2,757 (13.6)	344 (8.5)	8,099 (11.9)	1,296 (11.3)	721 (11.4)	14,168 (11.9)	12,853

[a] Includes 98 tons of herring recovered from gillnets that were lost or abandoned.

[b] Estimated waste from gillnets that were not recovered.

[c] Estimated waste from purse seine dead loss.

[d] Herring landed by department staff for calibration of biomass estimate.

Table 6. Achieved sample sizes compared to sampling goals for data used in the final age composition analysis of total run biomass and the commercial harvest.

Date	Fishing Section	Sample Size	Percent Goal Preseason (210/week)	Percent Goal (Thompson 1987) (405/strata) [a]	Age Range
Aerial Survey					
5/17	Kulukak & Nunavachak Combined	146	0.70	0.36	4–13
	Togiak Bay	372	1.77	0.92	4–13
	Hagemeister	360	1.71	0.89	5–13
	Pyrite Point	134	0.64	0.33	7–13
	Cape Newenham	175	0.83	0.43	5–14
5/24	Kulukak	534	2.54	1.32	3–12
	Nunavachak	301	1.43	0.74	4–11
	Togiak Bay	306	1.46	0.76	4–13
	Hagemeister	224	1.07	0.55	4–13
Commercial Purse Seine Harvest					
	Togiak Bay	183	0.87	0.45	4–13
	Hagemeister	172	0.82	0.42	5–12
	Pyrite Point	134	0.64	0.33	7–13
	Cape Newenham	148	0.70	0.37	5–14
Commercial Gillnet Harvest					
	Kulukak	180	0.86	0.44	6–13
	Nunavachak	173	0.82	0.43	7–14
	Total	353	1.68	0.87	6–14

[a] Time strata for age data weighted by aerial survey data was 3 d for estimation of total run biomass by fishing period for the commercial harvest analysis.

Table 7. Commercial harvest by gear type, escapement, and total run biomass observed in the Togiak District, 1988.

		Run Biomass				Commercial Purse Seine Harvest				Commercial Gillnet Harvest				Escapement			
Year Class	Age	Numbers of Fish (thousands)	%	Biomass (tonnes)	%	Numbers of Fish (thousands)	%	Biomass (tonnes)	%	Numbers of Fish (thousands)	%	Biomass (tonnes)	%	Numbers of Fish (thousands)	%	Biomass (tonnes)	%
1985	3	555	0.2	64	0.1	0	0.0	0	0.0	0	0.0	0	0.0	555	0.2	64	0.1
1984	4	22,340	6.2	2,771	2.3	249	0.9	38	0.4	0	0.0	0	0.0	22,339	6.4	2,733	2.5
1983	5	31,866	8.9	5,242	4.3	1,782	6.8	366	3.8	0	0.0	0	0.0	31,859	9.1	4,876	4.5
1982	6	5,780	1.6	1,413	1.2	539	2.0	124	1.3	0	0.0	0	0.0	5,778	1.7	1,288	1.2
1981	7	49,778	13.9	14,558	11.9	4,144	15.7	1,217	12.8	1,145	12.8	355	10.6	48,617	13.9	12,986	11.9
1980	8	17,200	4.8	5,618	4.6	1,699	6.4	573	6.0	585	6.5	202	6.0	16,609	4.7	4,843	4.4
1979	9	54,215	15.1	20,920	17.1	4,351	16.5	1,602	16.9	2,289	25.5	849	25.3	51,910	14.8	18,469	16.9
1978	10	113,721	31.7	45,198	37.0	9,242	35.0	3,704	39.0	3,892	43.3	1,509	45.0	109,794	31.4	39,985	36.6
1977	11	50,999	14.2	20,997	17.2	3,730	14.1	1,576	16.6	890	9.9	362	10.8	50,095	14.3	19,059	17.4
1976	12	6,793	1.9	3,114	2.5	539	2.0	239	2.5	153	1.7	64	1.9	6,638	1.9	2,811	2.6
1975	13	5,536	1.5	2,214	1.8	83	0.3	41	0.4	25	0.3	11	0.3	5,511	1.6	2,163	2.0
1974	14	67	0.0	34	0.0	41	0.2	21	0.2	0	0.0	0	0.0	67	0.0	13	0.0
Total		358,850		122,144		26,399		9,501		8,979		3,352		349,771		109,291	

Table 8. Daily observed biomass estimates (short tons) of herring from aerial survey estimates by index area during the 1988 season, Togiak District. [a]

Date [c]	Time Surveyed	Survey Conditions	Milt Observations No.	Milt Observations (KM)	Estimated Biomass by Index Area [b] NUS	KUK	MET	NUK	UGL	TOG	TNG	MTG	HAG	OSK	PYR	CN	Total (tons)	Total (tonnes)
4/19–5/07			0	0.0													0	0
5/08	1545	Good	0	0.0					6								6	5
5/09	0930	Poor	0	0.0													0	0
5/09	1615	Good	0	0.0					9								9	8
5/11	0700	Poor	0	0.0													0	0
5/12	0645	Good	0	0.0	0	0	0	0	2	0	0	0	1,768	0	0	0	1,770	1,606
5/12	1900	Fair	0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5/13	0820	Fair	0	0.0			0	0	231	5,671	700	697	5,171				12,470	11,313
5/13	1900	Excellent	0	0.0					141	5,908	14,771	294	10,752				31,866	28,909
5/14	0825	Fair	0	0.0						16,280	2,412		722				19,414	17,612
5/15	0900	Fair	0	0.0				1,517	21,875	9	195	140	904				24,640	22,353
5/15	1830	Good	2	2.4	0	0	46	662	3,379	18,820	17	10,065	85	5,373	410	0	38,857	35,251
5/16	0940	Good	1				0	2,044	31,315	9,422	56	5,682	67	3,569			52,155 [d]	47,315
5/16	1505	Good	11	5.6						20,757	29,929	24,858		13,855	1,075	5,057	95,531 [d]	86,665
5/17	0750		20	36.6					Spawn Survey								[e]	0
5/18	1200	Good			7,488	7,551	9,831	10,093	4,482	6,514	2,829	970	324	1,919	363	336	66,686 [f]	60,497
5/18	2200	Good	30	20.8					Spawn Survey									0
5/19	1330	Good	26	14.6	720	7,405	859	4,499	3,453	7,711	1,029	74	315	593	68		26,726	24,246
5/21	1430	Good	3	1.4	3,221	13,168	1,313	53 [b]	10,486	8,432	516	1,485	617	111			39,402	35,745
5/22	1130	Excellent	5	2.1		746	132	298	4,200								5,376 [g]	4,877
5/22	1550	Excellent	9	6.6	1,481	10,945 *	2,294 *	1,006	2,343	11,049 *	512 *	538 *	1,395 *	125 *	0		31,688	28,747
5/23	1900	Good	1	5.6		7,866	587	610	112								9,175	8,324
5/24	1115	Fair	5	4.5		1,591	149	56	496	104							2,396 [g]	2,174
5/24	1215	Good	1	1.6 [h]														0
			114	101.9														

[a] Togiak District Pacific herring biomass was estimated at 134,718 short tons, which is a summation of:
(1) Peak estimate of 128, 959 tons observed 16 May, less 2.6% to account for presence of herring ages 3–5, equals 125,582 tons.
(2) Combined biomass estimates for Kulukak, Metervik, Togiak, Tongue Point, Matogak, Hagemeister, and Osviak index areas on 22 May where corresponding age composition data were available and 33% of the population (9,136 tons) represents the proportion of age 3- to 5-year-old herring present in these combined areas.
(3) Summation of the 9,135 tons of herring to the revised peak estimate of 125,582 tons.

[b] Index Areas: NUS — Nushagak Peninsula; KUK — Kulukak; MET — Metervik; NUK — Nunavachak; UGL — Ungalikthluk/Togiak; TOG — Togiak; TNG — Tongue Point; MTG — Matogak; HAG — Hagemeister; OSK — Osviak; PYT — Pyrite Point; CN — Cape Newenham.

[c] Herring schools were only observed on 9 and 11 May for surveys performed intermittently from 19 April through 11 May. Surveys were flown regularly beginning 12 May through 22 May.

[d] Peak estimate of 128,959 short tons is the summation of the peak count in each index area across surveys conducted on 16 May.

[e] Date of both the gillnet and purse seine fisheries. Spawn-on-kelp fishery occurred 22 May.

[f] Includes 13,986 tons removed by fishery on 17 May. Observed biomass was 52,700.

[g] Partial survey.

[h] Southeast end of Summit Island only.

Table 9. Age-composition data for each combined 3-d sampling stratum weighted by 16 May aerial survey data for each fishing section. These data are used in calculating the final revised biomass estimate, Togiak District, 1988.

Sampling Dates: 15–16 May Section: Nunavachak and Kulukak combined [a] Biomass Estimate: 30,263 tonnes				Sampling Dates: 15–17 May Section: Togiak [b] Biomass Estimate: 18,831 tonnes				Sampling Dates: 15–16 May Section: Hagemeister Biomass Estimate: 62,334 tonnes				Sampling Date: 17 May Index Area: Pyrite Point Biomass Estimate: 975 tonnes				Date: 17 May Index Area: Cape Newenham Biomass Estimate: 4,588 tonnes			
Age	Number of Samples	Percent by Number	Numbers (x 1,000)	Age	Number of Samples	Percent by Number	Numbers (x 1,000)	Age	Number of Samples	Percent by Number	Numbers (x 1,000)	Age	Number of Samples	Percent by Number	Numbers (x 1,000)	Age	Number of Samples	Percent by Number	Numbers (x 1,000)
1	0	0.0%	0	1	0	0.0%	0	1	0	0.0%	0	1	0	0.0%	0	1	0	0.0%	0
2	0	0.0%	0	2	0	0.0%	0	2	0	0.0%	0	2	0	0.0%	0	2	0	0.0%	0
3	0	0.0%	0	3	1	0.3%	149	3	0	0.0%	0	3	0	0.0%	0	3	0	0.0%	0
4	1	0.7%	624	4	7	1.8%	1,042	4	0	0.0%	0	4	0	0.0%	0	4	0	0.0%	0
5	6	4.1%	3,744	5	54	14.1%	8,039	5	4	1.1%	1,728	5	0	0.0%	0	5	1	0.6%	68
6	3	2.0%	1,872	6	11	2.9%	1,638	6	6	1.7%	2,593	6	1	0.7%	18	6	1	0.6%	68
7	19	12.9%	11,855	7	89	23.3%	13,249	7	61	16.9%	26,358	7	13	9.6%	239	7	12	6.9%	821
8	9	6.1%	5,616	8	21	5.5%	3,126	8	19	5.2%	8,210	8	7	5.2%	129	8	15	8.6%	1,027
9	27	18.4%	16,847	9	48	12.6%	7,146	9	73	20.2%	31,543	9	33	24.4%	608	9	34	19.5%	2,327
10	49	33.3%	30,574	10	103	27.0%	15,334	10	126	34.8%	54,445	10	47	34.8%	865	10	62	35.6%	4,244
11	22	15.0%	13,727	11	38	9.9%	5,657	11	61	16.9%	26,358	11	29	21.5%	534	11	41	23.6%	2,806
12	6	4.1%	3,744	12	8	2.1%	1,191	12	6	1.7%	2,593	12	4	3.0%	74	12	7	4.0%	479
13	5	3.4%	3,120	13	2	0.5%	298	13	6	1.7%	2,593	13	1	0.7%	18	13	0	0.0%	0
14	0	0.0%	0	14	0	0.0%	0	14	0	0.0%	0	14	0	0.0%	0	14	1	0.6%	68
Total	147	100.0%	91,723	Total	382	100.0%	56,869	Total	362	100.0%	156,421	Total	135	100.0%	2,485	Total	174	100.0%	11,908

		Percent Weighted by				Percent Weighted by				Percent Weighted by				Percent Weighted by				Percent Weighted by	
Age	Weight	Weight	Biomass	Age	Weight	Weight	Biomass	Age	Weight	Weight	Biomass	Age	Weight	Weight	Biomass	Age	Weight	Weight	Biomass
1	0	0.0%	0	1	0	0.0%	0	1	0	0.0%	0	1	0	0.0%	0	1	0	0.0%	0
2	0	0.0%	0	2	0	0.0%	0	2	0	0.0%	0	2	0	0.0%	0	2	0	0.0%	0
3	0	0.0%	0	3	154	0.1%	25	3	0	0.0%	0	3	0	0.0%	0	3	0	0.0%	0
4	183	0.4%	126	4	953	0.8%	156	4	0	0.0%	0	4	0	0.0%	0	4	0	0.0%	0
5	1,116	2.5%	767	5	9,874	8.6%	1,620	5	744	0.6%	355	5	0	0.0%	0	5	187	0.3%	16
6	694	1.6%	477	6	2,363	2.1%	387	6	1,421	1.1%	677	6	247	0.5%	5	6	216	0.4%	18
7	4,637	10.5%	3,189	7	23,098	20.1%	3,790	7	17,225	13.2%	8,205	7	3,691	7.7%	75	7	3,288	5.4%	273
8	2,177	4.9%	1,498	8	5,858	5.1%	962	8	6,440	4.9%	3,067	8	2,312	4.8%	47	8	4,531	7.5%	377
9	8,703	19.8%	5,986	9	16,700	14.6%	2,741	9	26,506	20.3%	12,625	9	11,107	23.1%	226	9	11,289	18.6%	939
10	15,758	35.8%	10,838	10	37,570	32.7%	6,165	10	48,862	37.3%	23,273	10	17,183	35.8%	348	10	22,498	37.0%	1,871
11	6,927	15.7%	4,765	11	14,312	12.5%	2,349	11	24,771	18.9%	11,798	11	11,339	23.6%	230	11	15,473	25.4%	1,287
12	2,065	4.7%	1,420	12	3,070	2.7%	503	12	2,530	1.9%	1,205	12	1,676	3.5%	34	12	2,877	4.7%	239
13	1,740	4.0%	1,197	13	800	0.7%	132	13	2,371	1.8%	1,129	13	492	1.0%	10	13	0	0.0%	0
14	0	0.0%	0	14	0	0.0%	0	14	0	0.0%	0	14	0	0.0%	0	14	448	0.7%	37
Total	44,000	100.0%	30,262	Total	114,751	100.0%	18,831	Total	130,871	100.0%	62,335	Total	48,047	100.0%	977	Total	60,807	100.0%	5,057

[a] Includes survey index areas NUS, KUK, MET, NUN, UGL.

[b] Includes survey index area TOG.

Table 10. Age-composition data for each combined 3-d sampling stratum weighted by 24 May aerial survey data for each fishing section. These data are used in calculating the final revised biomass estimate, Togiak District, 1988.

Sampling Dates: 22–23 May
Section: Kulukak [a]
Biomass Estimate: 12,010 tonnes

Age	Number of Samples	Percent by Number	Numbers (x 1,000)
1	0	0.0%	0
2	0	0.0%	0
3	4	0.9%	521
4	104	23.4%	13,539
5	170	38.3%	22,130
6	25	5.6%	3,254
7	48	10.8%	6,249
8	21	4.7%	2,734
9	32	7.2%	4,166
10	30	6.8%	3,905
11	10	2.3%	1,301
12	0	0.0%	0
13	0	0.0%	0
14	0	0.0%	0
Total	444	100.0%	57,799

Sampling Dates: 21–22 May
Section: Nunavachak [b]
Biomass Estimate: 913 tonnes

Age	Number of Samples	Percent by Number	Numbers (x 1,000)
1	0	0.0%	0
2	0	0.0%	0
3	0	0.0%	0
4	24	12.5%	481
5	55	28.6%	1,103
6	11	5.7%	221
7	47	24.5%	943
8	9	4.7%	181
9	18	9.4%	361
10	17	8.9%	341
11	11	5.7%	221
12	0	0.0%	0
13	0	0.0%	0
14	0	0.0%	0
Total	192	100.0%	3,852

Sampling Dates: 21–22 May
Section: Togiak [c]
Biomass Estimate: 10,024 tonnes

Age	Number of Samples	Percent by Number	Numbers (x 1,000)
1	0	0.0%	0
2	0	0.0%	0
3	1	0.4%	157
4	41	15.8%	6,419
5	54	20.8%	8,454
6	8	3.1%	1,252
7	37	14.3%	5,792
8	8	3.1%	1,252
9	34	13.1%	5,323
10	48	18.5%	7,514
11	27	10.4%	4,227
12	1	0.4%	157
13	0	0.0%	0
14	0	0.0%	0
Total	259	100.0%	40,547

Sampling Date: 21–22 May
Section: Hagemeister [d]
Biomass Estimate: 2,331 tonnes

Age	Number of Samples	Percent by Number	Numbers (x 1,000)
1	0	0.0%	0
2	0	0.0%	0
3	0	0.0%	0
4	19	8.4%	683
5	38	16.8%	1,367
6	6	2.7%	216
7	49	21.7%	1,762
8	7	3.1%	252
9	29	12.8%	1,043
10	42	18.6%	1,511
11	27	11.9%	971
12	6	2.7%	216
13	3	1.3%	108
14	0	0.0%	0
Total	226	100.0%	8,129

Age	Weight	Percent Weighted by Weight	Percent Weighted by Biomass
1	0	0.0%	0
2	0	0.0%	0
3	416	0.5%	60
4	11,829	14.1%	1,697
5	25,971	31.0%	3,727
6	4,985	6.0%	716
7	11,205	13.4%	1,608
8	5,865	7.0%	842
9	10,003	12.0%	1,435
10	9,814	11.7%	1,408
11	3,611	4.3%	518
12	0	0.0%	0
13	0	0.0%	0
14	0	0.0%	0
Total	83,699	100.0%	12,010

Age	Weight	Percent Weighted by Weight	Percent Weighted by Biomass
1	0	0.0%	0
2	0	0.0%	0
3	0	0.0%	0
4	2,982	7.2%	66
5	8,662	21.0%	191
6	2,148	5.2%	47
7	10,867	26.3%	240
8	2,458	6.0%	54
9	5,266	12.8%	116
10	5,320	12.9%	118
11	3,573	8.7%	79
12	0	0.0%	0
13	0	0.0%	0
14	0	0.0%	0
Total	41,276	100.0%	913

Age	Weight	Percent Weighted by Weight	Percent Weighted by Biomass
1	0	0.0%	0
2	0	0.0%	0
3	109	0.2%	19
4	4,710	8.1%	813
5	7,920	13.6%	1,366
6	1,458	2.5%	251
7	8,271	14.2%	1,427
8	2,217	3.8%	383
9	9,887	17.0%	1,706
10	14,485	24.9%	2,499
11	8,641	14.9%	1,491
12	388	0.7%	67
13	0	0.0%	0
14	0	0.0%	0
Total	58,086	100.0%	10,024

Age	Weight	Percent Weighted by Weight	Percent Weighted by Biomass
1	0	0.0%	0
2	0	0.0%	0
3	0	0.0%	0
4	2,631	4.5%	104
5	6,144	10.4%	244
6	1,275	2.2%	51
7	12,117	20.6%	481
8	1,656	2.8%	65
9	8,843	15.0%	350
10	13,407	22.8%	532
11	9,556	16.3%	379
12	2,114	3.6%	83
13	1,061	1.8%	42
14	0	0.0%	0
Total	58,803	100.0%	2,331

[a] Includes survey index areas KUL, MET.

[b] Includes survey index area NUN.

[c] Includes survey index area TOG.

[d] Includes survey index areas MTG, HAG, TNG, OSK.

Table 11. Total weighted age composition in numbers of fish and by biomass of aerial survey data used to determine the final revised run biomass estimate, Togiak District, 1988. [a]

Togiak District Total Aerial Estimate for the 16 May Survey					Togiak District Total Aerial Estimate for the 22 May Survey					1988 Season Total Togiak District Total Run Biomass				
Age	Biomass (tonnes)	Percent by weight	Number of Fish (x 1,000)	Percent by Number	Age	Biomass (tonnes)	Percent by weight	Number of Fish (x 1,000)	Percent by Number	Age	Biomass (tonnes)	Percent by weight	Number of Fish (x 1,000)	Percent by Number
1	0	0.0%	0	0.0%	1	0	0.0%	0	0.0%	1	0	0.0%	0	0.0%
2	0	0.0%	0	0.0%	2	0	0.0%	0	0.0%	2	0	0.0%	0	0.0%
3	0	0.0%	0	0.0%	3	64	0.3%	555	0.5%	3	64	0.1%	555	0.2%
4	287	0.2%	1,694	0.5%	4	2,772	11.0%	22,340	20.1%	4	2,772	2.3%	22,340	6.2%
5	2,638	2.3%	13,039	4.1%	5	5,241	20.7%	31,866	28.7%	5	5,241	4.3%	31,866	8.9%
6	1,413	1.2%	5,780	1.8%	6	1,058	4.2%	4,922	4.4%	6	1,413	1.2%	5,780	1.6%
7	14,558	12.4%	49,778	15.6%	7	3,735	14.8%	14,794	13.3%	7	14,558	11.9%	49,778	13.9%
8	5,618	4.8%	17,200	5.4%	8	1,024	4.1%	3,470	3.1%	8	5,618	4.6%	17,200	4.8%
9	20,920	17.9%	54,215	17.0%	9	3,647	14.4%	11,211	10.1%	9	20,920	17.1%	54,215	15.1%
10	45,198	38.6%	113,721	35.7%	10	4,535	17.9%	13,177	11.9%	10	45,198	37.0%	113,721	31.7%
11	20,997	17.9%	50,999	16.0%	11	2,912	11.5%	7,937	7.1%	11	20,997	17.2%	50,999	14.2%
12	3,115	2.7%	6,793	2.1%	12	251	1.0%	648	0.6%	12	3,115	2.6%	6,793	1.9%
13	2,214	1.9%	5,536	1.7%	13	40	0.2%	109	0.1%	13	2,214	1.8%	5,536	1.5%
14	33	0.0%	67	0.0%	14	0	0.0%	0	0.0%	14	33	0.0%	67	0.0%
Total	116,991	100.0%	318,823	100.0%	Total	25,278	100.0%	111,029	100.0%	Total	122,144	100.0%	358,851	100.0%

[a] Summation of age 3–5 biomass calculated for the 22 May survey with age 4–14 biomass calculated for the 16 May aerial survey.

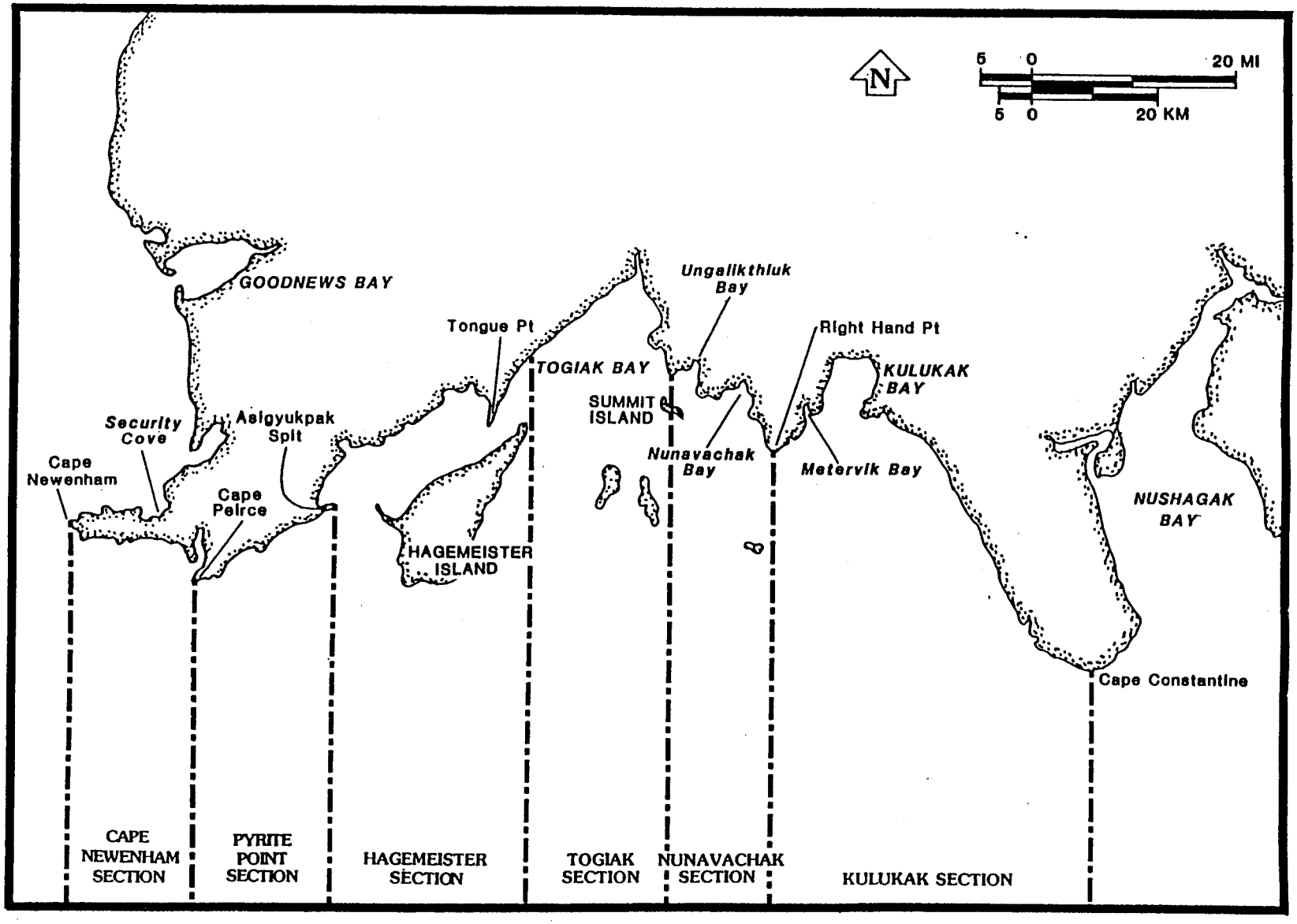

Figure 1. Southeastern Bering Sea and the Togiak District of Bristol Bay.

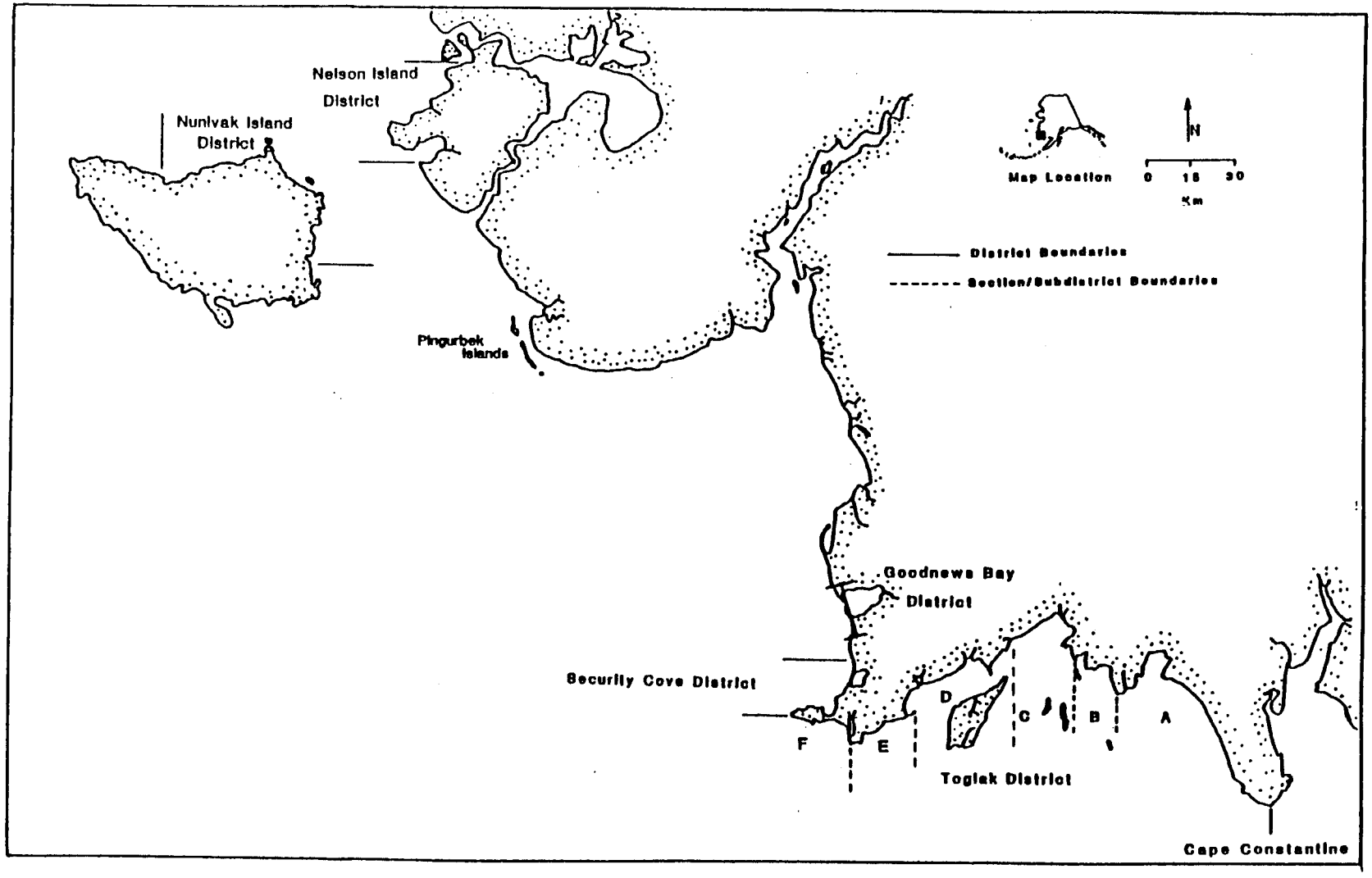

Figure 2. Fishery management sections for the Togiak District of Bristol Bay.

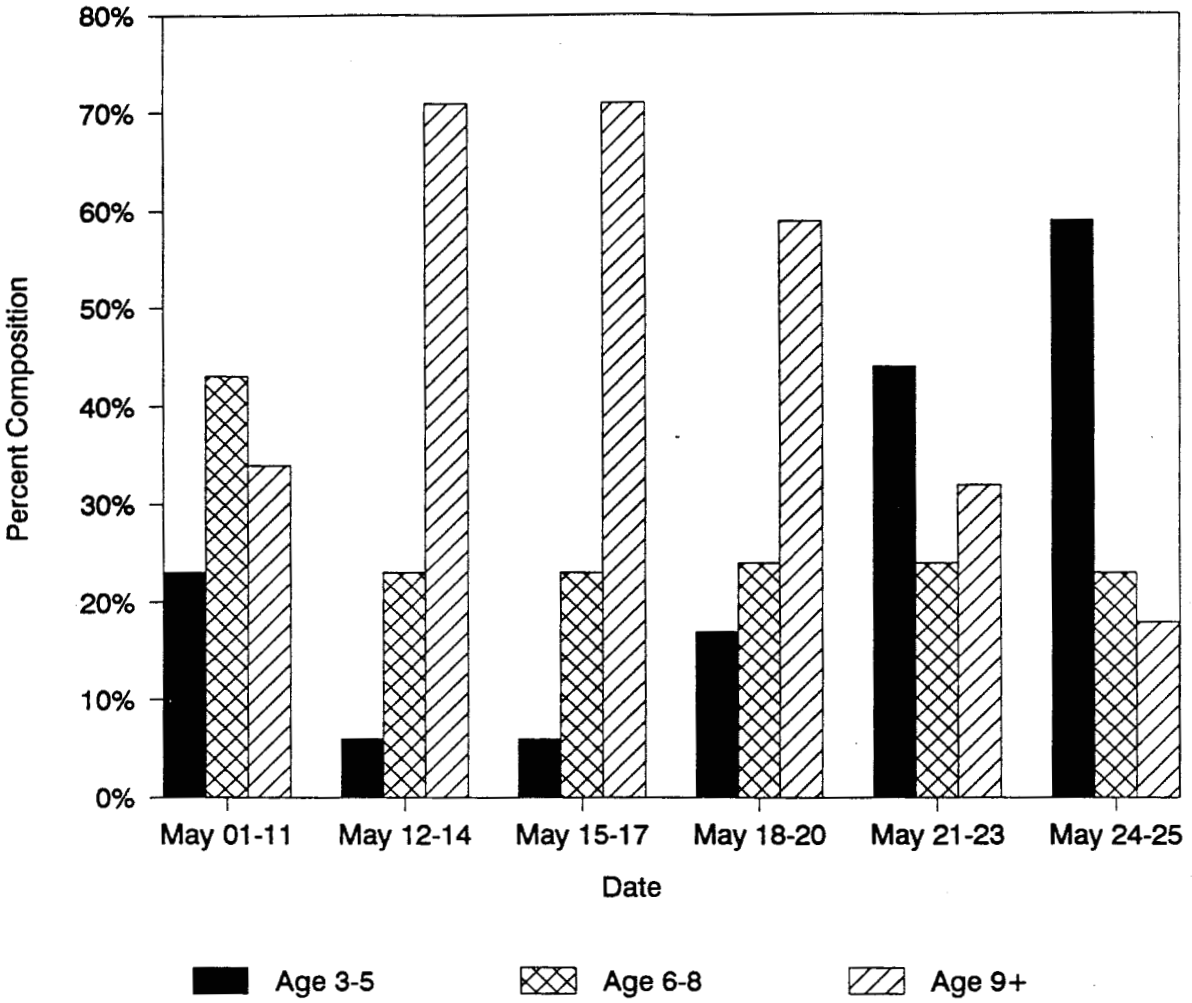

Figure 3. Age composition of herring samples collected by nonselective gear by sampling period.

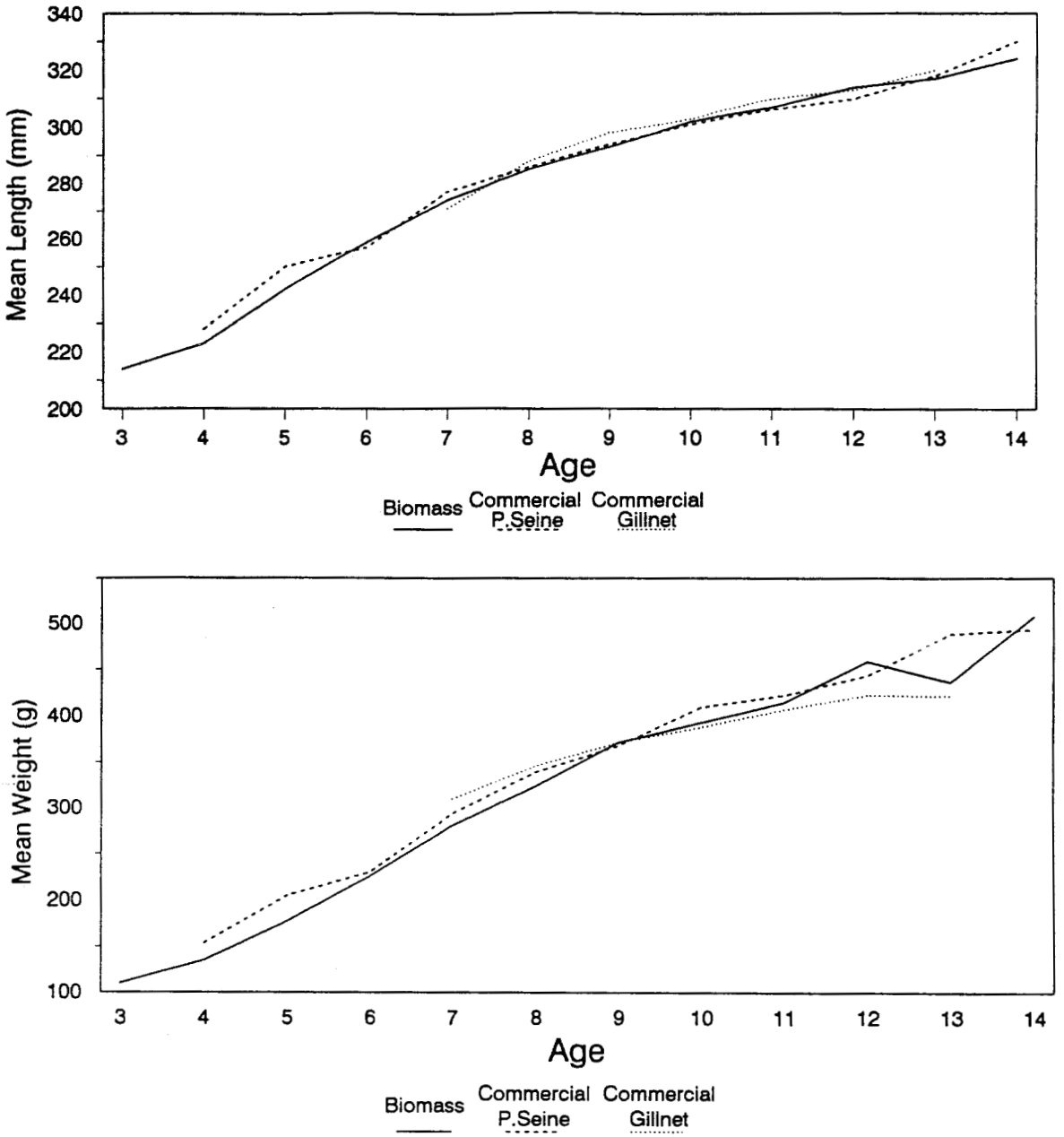

Figure 4. Mean length (upper) and weight-at-age (lower) representative of the run biomass and commercial harvests by gear type.

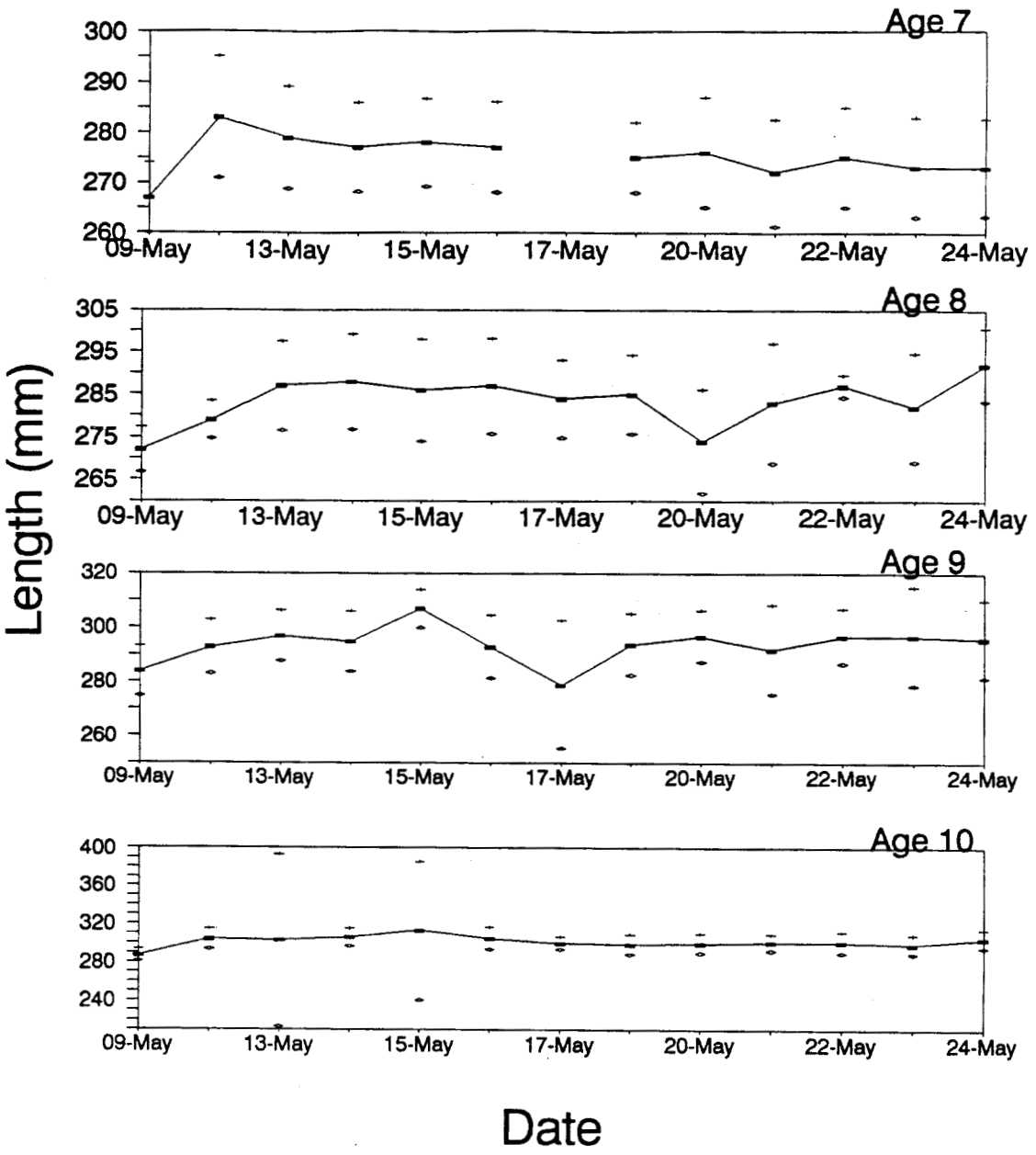

Figure 5. Mean length and standard deviation of age-7, -8, -9, and -10 herring caught by nonselective gear by date.

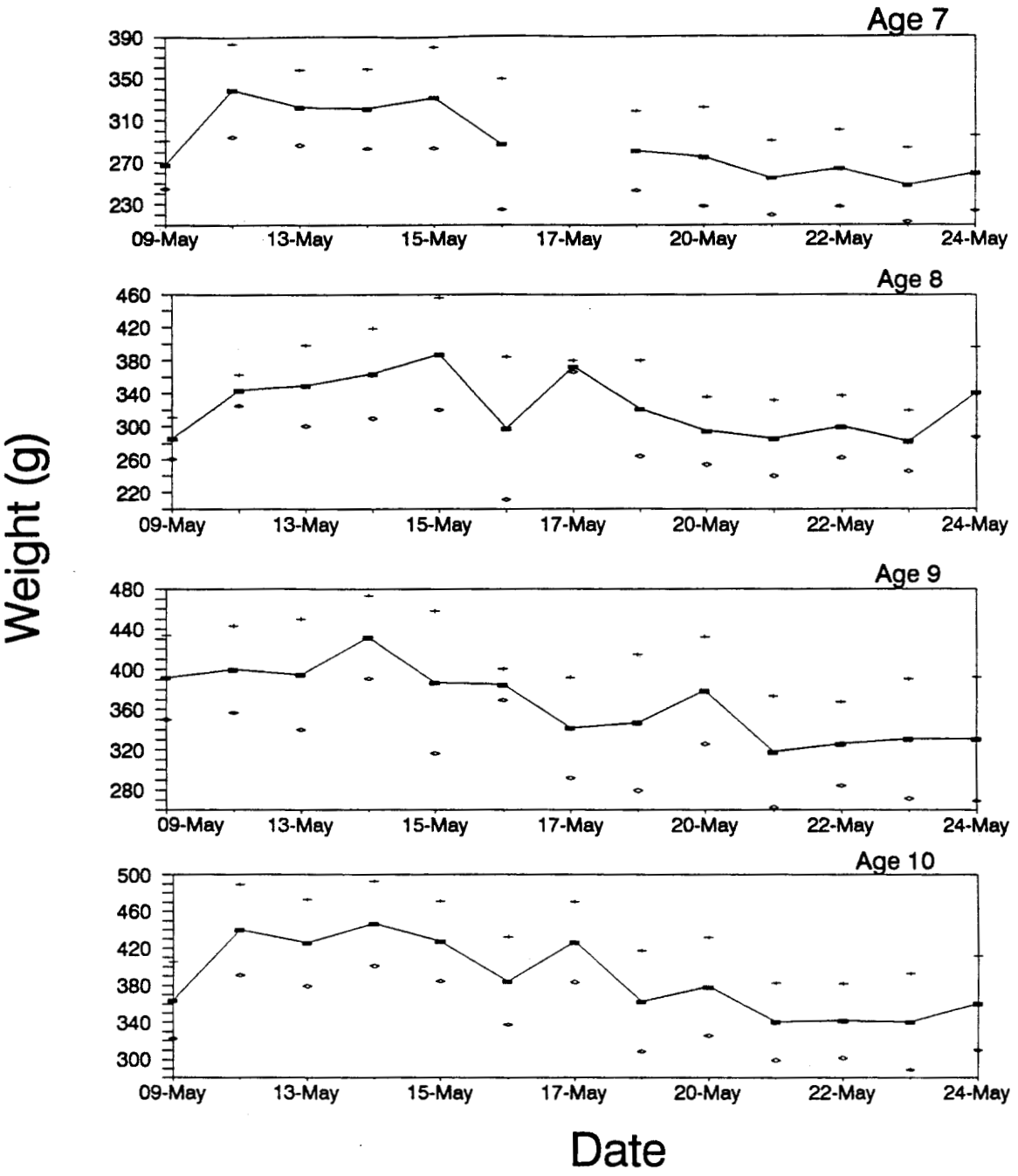

Figure 6. Mean weight and standard deviation of age-7, -8, -9, and -10 herring caught by nonselective gear by date.

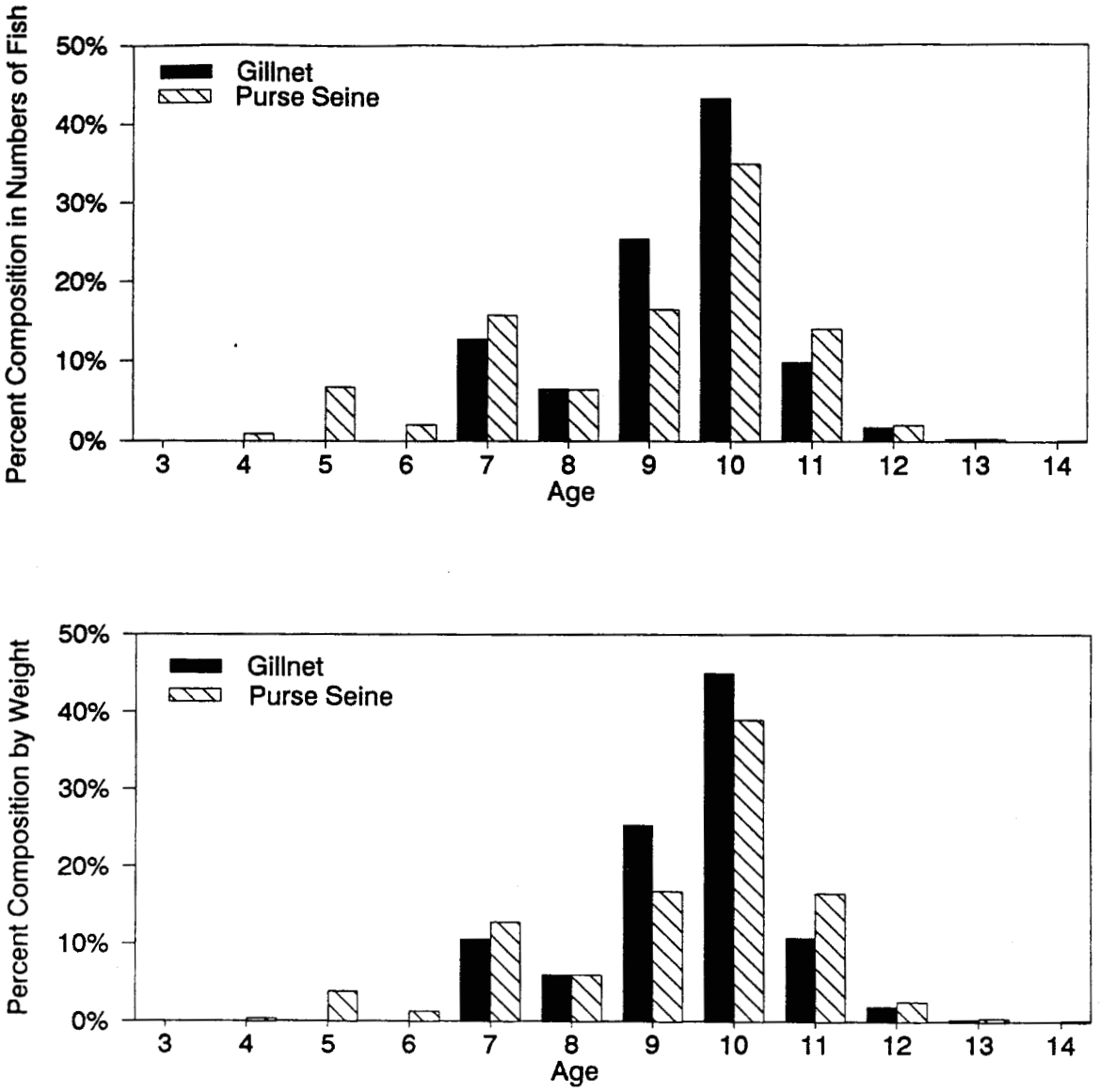

Figure 7. Age composition of the commercial gillnet and purse seine harvests.

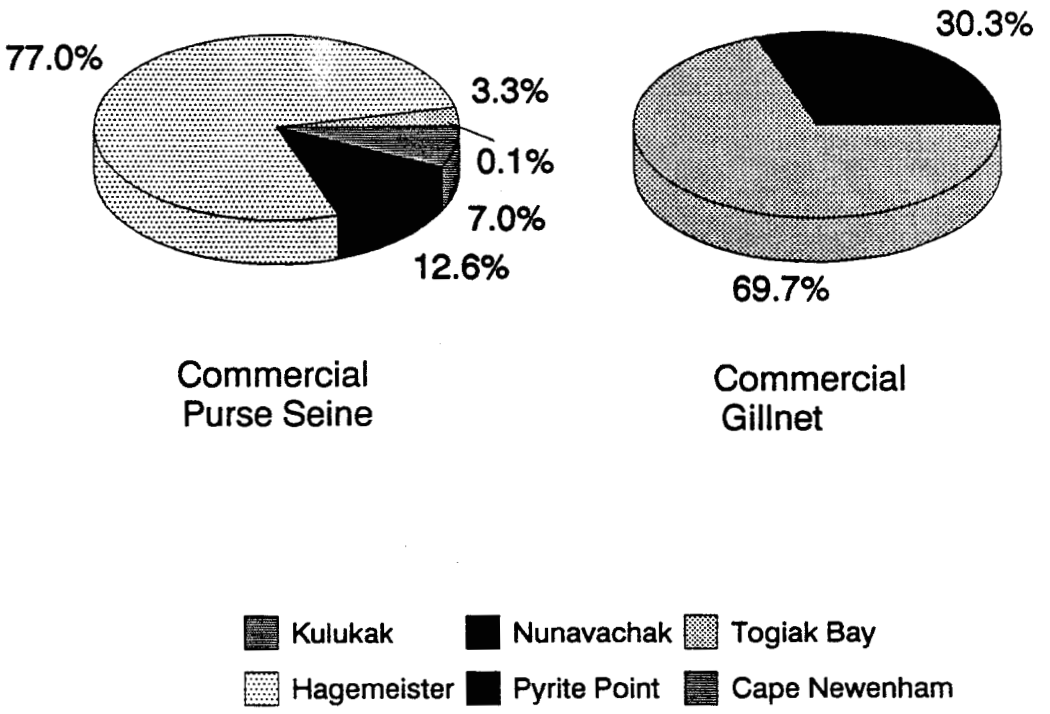

Figure 8. Proportion of the commercial harvest caught in each fishing section by gear type.

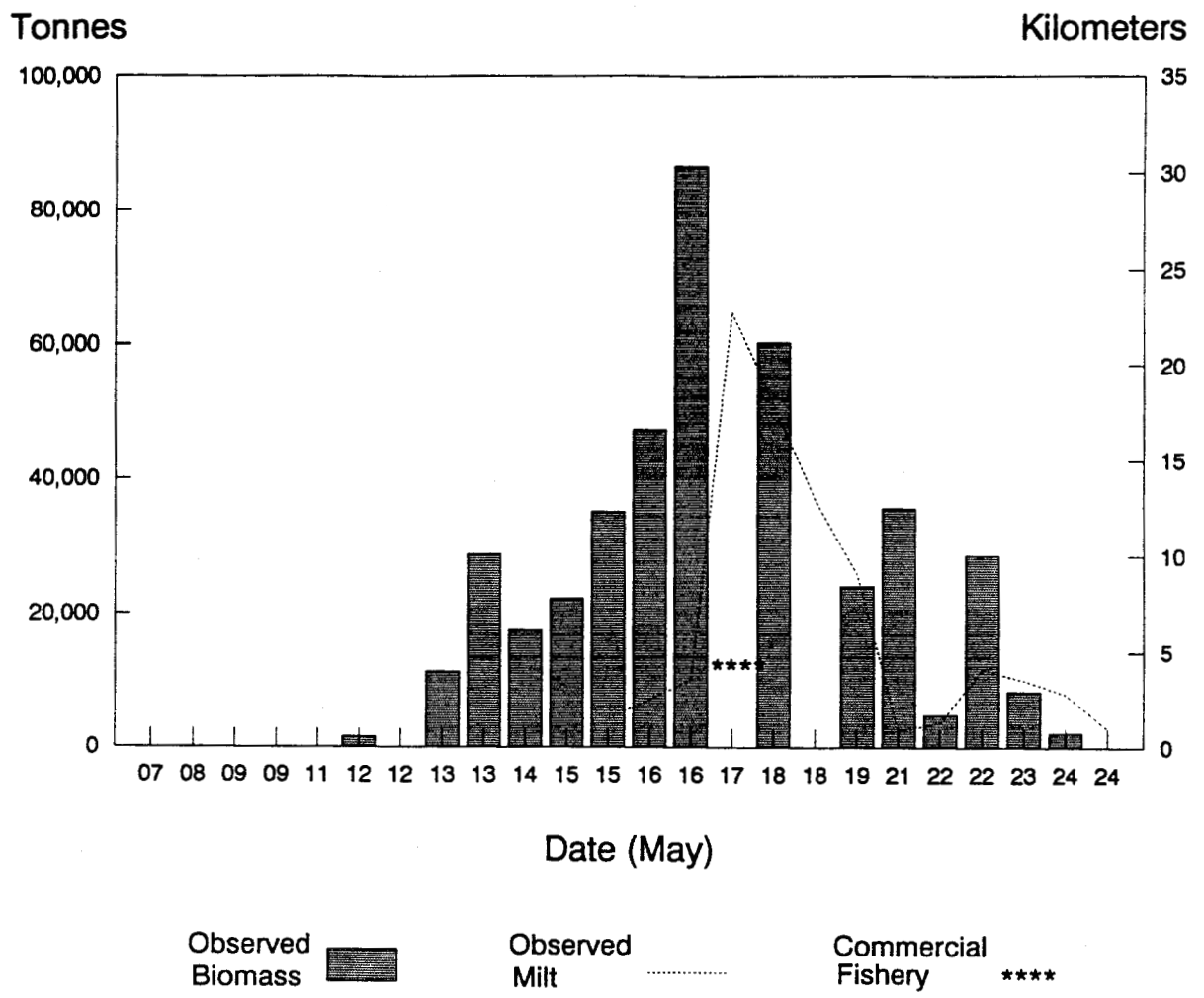

Figure 9. Biomass (tonnes) and kilometers of milt observed during daily aerial assessments.

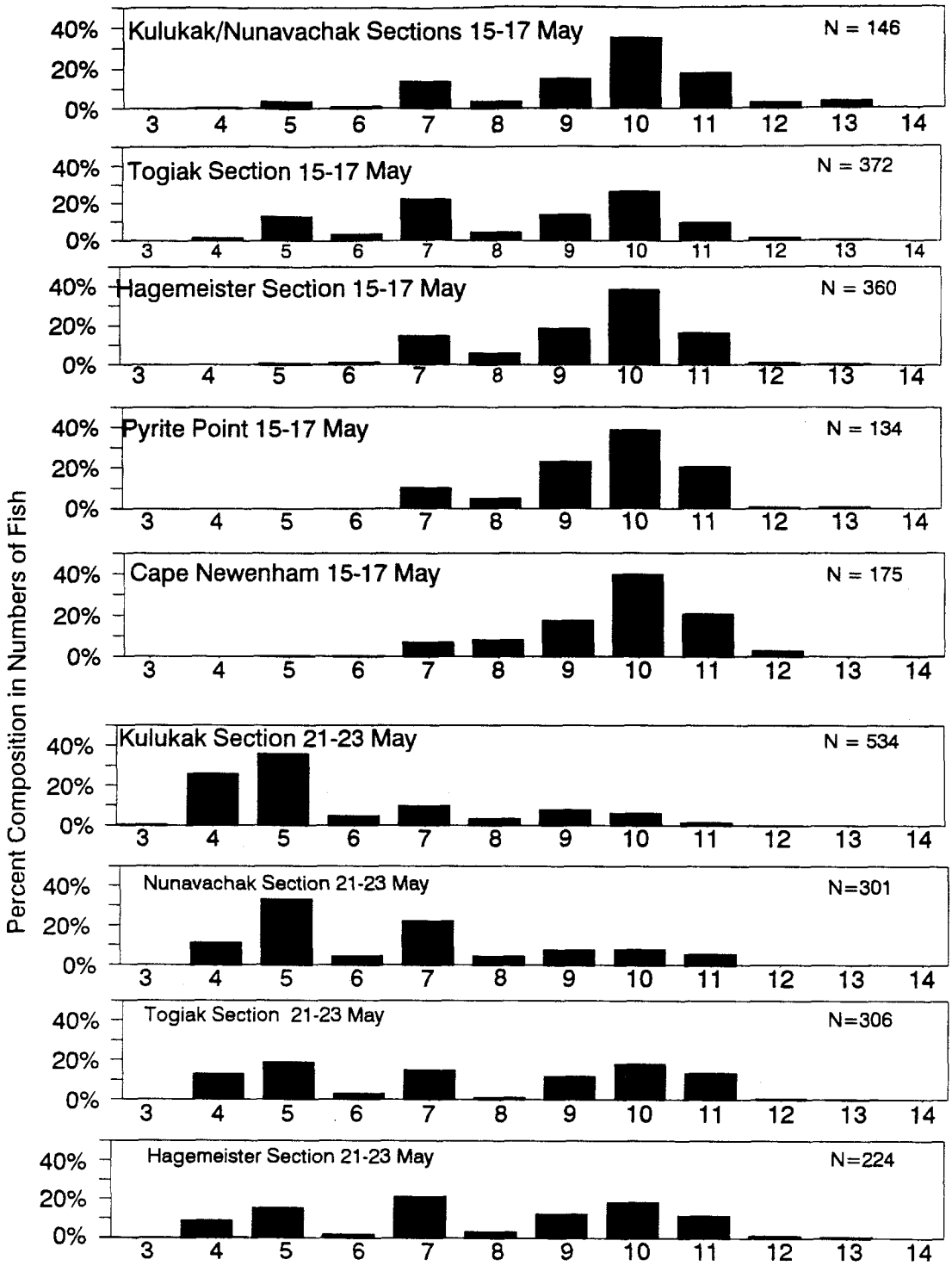

Figure 10. Age composition by sampling period and fishing section corresponding to aerial surveys conducted 16 and 24 May.

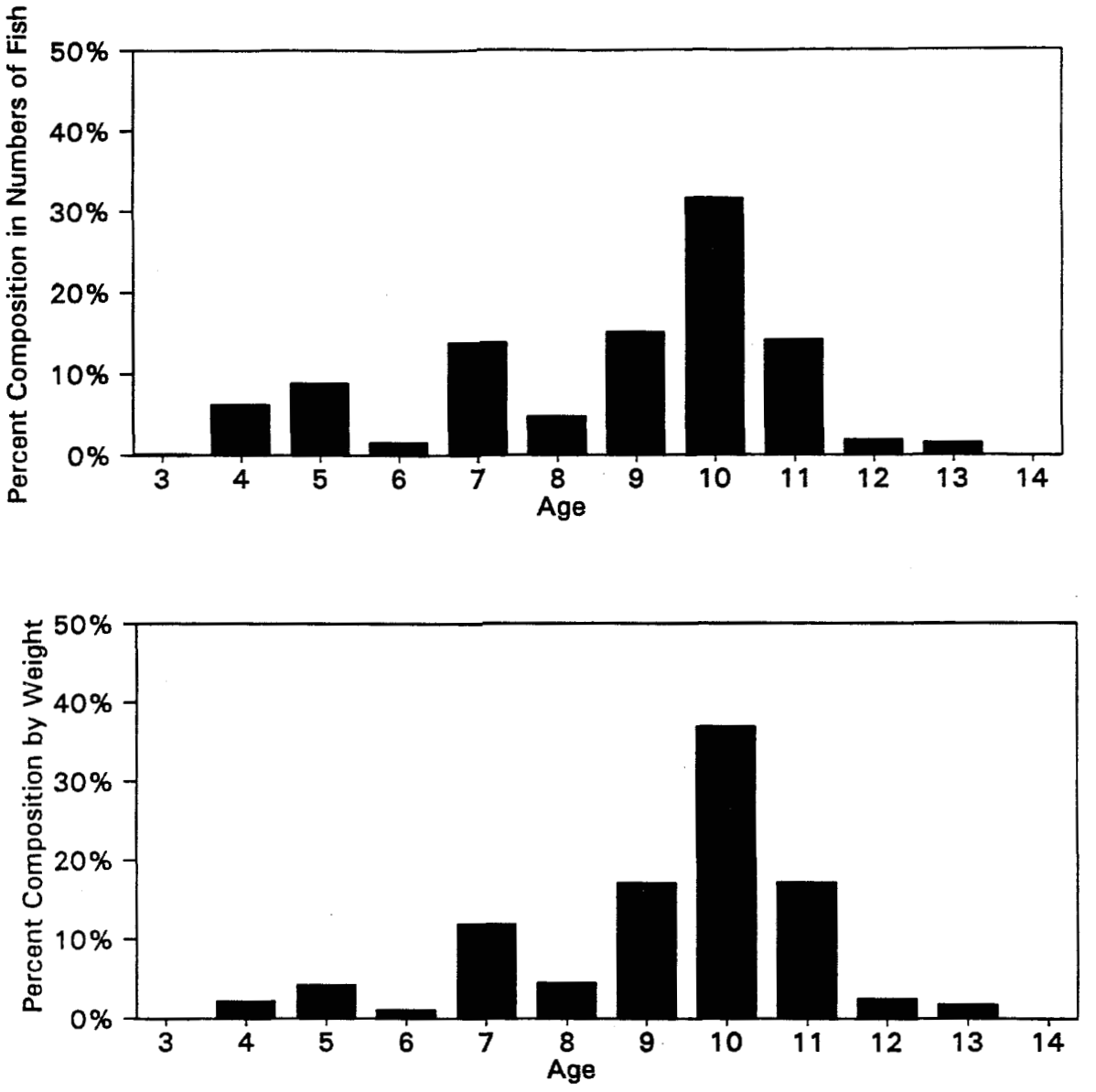

Figure 11. Age composition by number (top) and by weight (bottom) of the Togiak District total run herring biomass, 1988.

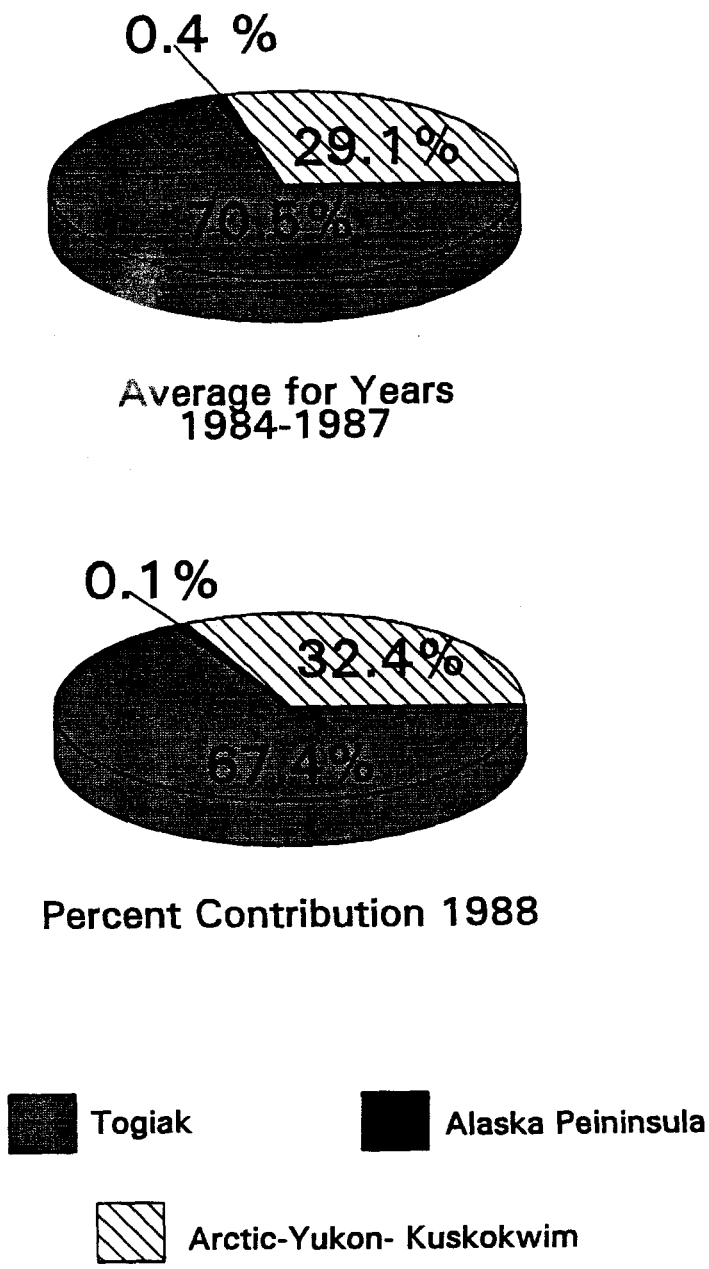

Figure 12. Contribution of the Togiak herring total run biomass to the assessed total run biomass in the eastern Bering Sea.

APPENDIX

Appendix A

Appendix A.1. Age, sex, and size composition of Pacific herring caught by commercial purse seine, Togiak Section, 17 May 1988.

		Sex (number)				Percent	Weight			Length		
Sample Dates	Age	Male	Female	Unknown	Total	of Total	Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	3											
	4	4	2	0	6	3.3	153	30.6	6	228	10.6	6
	5	13	27	0	40	22.2	205	37.2	39	250	8.9	40
	6	3	8	0	11	6.1	232	45.4	11	261	15.4	11
	7	26	23	0	49	27.2	283	37.2	48	278	8.7	49
	8	4	4	0	8	4.4	317	38.6	8	284	10.1	8
17 May	9	13	4	0	17	9.4	324	49.2	17	292	13.0	17
	10	16	17	0	33	18.3	377	45.8	33	300	10.6	33
	11	8	3	0	11	6.1	387	58.9	11	312	7.8	11
	12	3	1	0	4	2.2	379	51.9	4	309	14.3	4
	13	1	0	0	1	0.6	436		1	314		1
	14											
	15											
Sample Total		91	89	0	180	100.0	291	81.1	178	278	24.3	180
Sex Composition		50.6	49.4									
Unaged		10	16	0	26	14.4	307	80.1	26	280	22.9	26
Sex Composition		38.5	61.5									

Appendix A.2. Age, sex, and size composition of Pacific herring caught by commercial purse seine, Hagemeister Section, 17 May 1988.

		Sex (number)				Percent	Weight			Length		
Sample Dates	Age	Male	Female	Unknown	Total	of Total	Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	3											
	4											
	5	1	1	0	2	1.2	203	7.1	2	244	5.7	2
	6	1	0	0	1	0.6	202		1	245		1
	7	13	11	0	24	14.0	302	31.9	24	273	6.2	24
	8	2	8	0	10	5.8	366	26.2	10	283	7.6	10
17 May	9	12	18	0	30	17.4	392	45.6	30	294	6.4	30
	10	33	48	0	81	47.1	417	51.0	81	300	8.6	81
	11	7	14	0	21	12.2	443	42.3	21	302	6.5	21
	12	0	3	0	3	1.7	515	7.0	3	315	5.6	3
	13											
	14											
	15											
Sample Total		69	103	0	172	100.0	395	68.0	172	294	14.2	172
Sex Composition		40.1	59.9									
Unaged		18	19	0	37	21.5	387	76.7	37	295	17.3	37
Sex Composition		48.6	51.4									

Appendix A.3. Age, sex, and size composition of Pacific herring caught by commercial purse seine, Pyrite Point Section, 17 May 1988.

		Sex (number)				Percent	Weight			Length		
Sample Dates	Age	Male	Female	Unknown	Total	of Total	Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	3											
	4											
	5											
	6											
	7	9	5	0	14	10.4	310	52.2	14	274	8.2	14
	8	4	3	0	7	5.2	354	59.8	7	287	4.4	7
17 May	9	18	13	0	31	23.1	371	39.6	31	293	8.0	31
	10	26	26	0	52	38.8	397	50.0	52	299	9.0	52
	11	17	11	0	28	20.9	439	54.8	28	305	9.4	28
	12	0	1	0	1	0.7	476		1	314		1
	13	0	1	0	1	0.7	542		1	322		1
	14											
	15											
Sample Total		74	60	0	134	100.0	390	62.7	134	296	12.5	134
Sex Composition		55.2	44.8									
Unaged		19	17	0	36	26.9	401	75.2	36	300	13.1	36
Sex Composition		52.8	47.2									

Appendix A.4. Age, sex, and size composition of Pacific herring caught by commercial purse seine, Cape Newenham Section, 17 May 1988.

		Sex (number)				Percent	Weight			Length		
Sample Dates	Age	Male	Female	Unknown	Total	of Total	Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	3											
	4											
	5	0	1	0	1	0.7	206		1	248		1
	6	1	0	0	1	0.7	238		1	230		1
	7	5	8	0	13	8.8	302	33.2	13	282	7.6	13
	8	8	5	0	13	8.8	324	35.7	13	289	4.9	13
17 May	9	13	14	0	27	18.2	366	42.5	27	299	8.2	27
	10	30	27	0	57	38.5	395	45.6	57	305	7.3	57
	11	10	20	0	30	20.3	406	47.0	30	308	9.3	30
	12	3	2	0	5	3.4	446	56.4	5	306	10.2	5
	13											
	14	1	0	0	1	0.7	494		1	330		1
	15											
Sample Total		71	77	0	148	100.0	378	59.1	148	300	13.5	148
Sex Composition		48.0	52.0									
Unaged		12	7	0	19	12.8	384	64.7	19	301	12.1	19
Sex Composition		63.2	36.8									

Appendix A.5. Age, sex, and size composition of Pacific herring caught by commercial purse seine, Togiak, Hagemeister, Pyrite Point, and Cape Newenham Sections combined, 17 May 1988.

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4	4	2	0	6	0.9	153	30.6	6	228	10.6	6
	5	14	29	0	43	6.8	205	35.9	42	250	8.7	43
	6	5	8	0	13	2.1	230	42.4	13	257	16.9	13
	7	53	47	0	100	15.8	294	38.9	99	277	8.3	100
	8	18	20	0	38	6.0	339	43.2	38	286	7.1	38
17 May	9	56	49	0	105	16.6	368	48.5	105	294	8.9	105
	10	105	118	0	223	35.2	401	50.3	223	301	9.0	223
	11	42	48	0	90	14.2	423	53.4	90	306	9.0	90
	12	6	7	0	13	2.1	444	67.0	13	310	10.2	13
	13	1	1	0	2	0.3	489	75.0	2	318	5.7	2
	14	1	0	0	1	0.2	494		1	330		1
	15											
Sample Total		305	329	0	634	100.0	360	81.8	632	291	19.4	634
Sex Composition		48.1	51.9									
Unaged		59	59	0	118	18.6	373	82.5	118	294	18.5	118
Sex Composition		50.0	50.0									

Appendix A.6. Age, sex, and size composition of Pacific herring caught by commercial gillnet, Kulukak Section, 17 May 1988.

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5											
	6											
	7	10	7	0	17	9.4	297	44.6	17	278	9.7	17
	8	8	4	0	12	6.7	330	28.3	12	285	7.0	12
17 May	9	30	22	0	52	28.9	360	45.3	52	295	8.8	52
	10	43	40	0	83	46.1	390	44.6	83	302	8.3	83
	11	9	4	0	13	7.2	413	45.4	13	309	6.8	13
	12	3	0	0	3	1.7	403	64.7	3	309	4.6	3
	13											
	14											
	15											
Sample Total		103	77	0	180	100.0	370	53.7	180	297	11.7	180
Sex Composition		57.2	42.8									
Unaged		14	16	0	30	16.7	366	50.3	30	299	12.5	30
Sex Composition		46.7	53.3									

Appendix A.7. Age, sex, and size composition of Pacific herring caught by commercial gillnet, Nunavachak Section, 17 May 1988.

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5											
	6											
	7	9	18	1	28	16.2	318	29.9	28	283	6.9	28
	8	5	6	0	11	6.4	364	50.0	11	292	8.8	11
17 May	9	18	20	0	38	22.0	386	49.5	38	301	10.2	38
	10	39	31	0	70	40.5	385	43.9	70	303	11.0	70
	11	9	13	0	22	12.7	403	43.7	22	311	7.3	22
	12	1	2	0	3	1.7	442	48.5	3	317	13.0	3
	13	1	0	0	1	0.6	422		1	320		1
	14											
	15											
Sample Total		82	90	1	173	100.0	377	51.3	173	300	13.1	173
Sex Composition		47.7	52.3									
Unaged		21	16	0	37	21.4	395	53.6	37	303	17.0	37
Sex Composition		56.8	43.2									

Appendix A.8. Age, sex, and size composition of Pacific herring caught by commercial gillnet, Kulukak and Nunavachak Sections combined, 17 May 1988.

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5											
	6											
	7	19	25	1	45	12.7	310	37.2	45	281	8.3	45
	8	13	10	0	23	6.5	346	42.8	23	288	8.3	23
17 May	9	48	42	0	90	25.5	371	48.7	90	298	9.9	90
	10	82	71	0	153	43.3	388	44.2	153	303	9.6	153
	11	18	17	0	35	9.9	407	44.0	35	310	7.1	35
	12	4	2	0	6	1.7	423	55.4	6	313	9.8	6
	13	1	0	0	1	0.3	422		1	320		1
	14											
	15											
Sample Total		185	167	1	353	100.0	373	52.6	353	299	12.5	353
Sex Composition		52.6	47.4									
Unaged		35	32	0	67	19.0	382	53.8	67	301	15.2	67
Sex Composition		52.2	47.8									

Appendix A.9. Age, sex, and size composition of Pacific herring caught by test commercial purse seine, Kulukak Section, 23 May 1988.

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4	12	10	0	22	22.9	137	16.9	22	230	7.3	22
	5	17	23	0	40	41.7	173	20.5	40	245	8.0	40
	6	2	4	0	6	6.3	216	46.0	6	262	17.9	6
	7	6	2	0	8	8.3	245	46.5	8	276	11.5	8
	8	3	0	0	3	3.1	320	8.0	3	293	8.1	3
23 May	9	4	1	0	5	5.2	334	53.1	5	299	19.1	5
	10	10	0	0	10	10.4	332	57.9	10	302	8.0	10
	11	1	1	0	2	2.1	417	24.0	2	310	0.0	2
	12											
	13											
	14											
	15											
Sample Total		55	41	0	96	100.0	208	80.8	96	257	27.4	96
Sex Composition		57.3	42.7									
Unaged		2	9	0	11	11.5	238	121.9	11	259	36.5	11
Sex Composition		18.2	81.8									

Appendix A.10. Age, sex, and size composition of Pacific herring caught by test commercial purse seine, Nunavachak Section, 13–24 May 1988.

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5											
	6	1	1	0	2	2.5	281	4.2	2	276	11.3	2
	7	1	4	0	5	6.3	339	35.1	5	287	6.7	5
	8	4	2	0	6	7.6	335	33.9	6	289	7.3	6
13 May	9	6	9	0	15	19.0	397	49.5	15	299	9.2	15
	10	22	12	0	34	43.0	411	40.5	34	303	7.2	34
	11	8	4	0	12	15.2	432	40.4	12	313	9.8	12
	12	0	2	0	2	2.5	506	22.6	2	321	4.2	2
	13	2	0	0	2	2.5	465	75.0	2	316	24.7	2
	14	0	1	0	1	1.3	504		1	326		1
	15											
Sample Total		44	35	0	79	100.0	403	56.9	79	302	12.3	79
	3											
	4											
	5											
	6											
	7	2	4	0	6	7.1	230	108.8	6	286	6.1	6
	8	0	3	0	3	3.5	262	118.7	3	301	7.0	3
16 May	9	4	7	0	11	12.9	339	119.6	11	301	12.4	11
	10	17	18	0	35	41.2	315	77.9	35	312	9.4	35
	11	10	11	0	21	24.7	324	82.9	21	313	11.7	21
	12	1	2	0	3	3.5	408	117.2	3	321	8.1	3
	13	5	1	0	6	7.1	370	73.4	6	320	9.9	6
	14											
	15											
Sample Total		39	46	0	85	100.0	320	93.2	85	309	12.8	85
	3											
	4	1	0	0	1	1.1	312		1	230		1
	5	4	7	0	11	12.1	186	23.2	11	249	6.4	11
	6	1	0	0	1	1.1	220		1	260		1
	7	11	8	0	19	20.9	279	48.9	19	279	8.3	19
	8	2	2	0	4	4.4	310	36.9	4	280	6.6	4
20 May	9	11	8	0	19	20.9	349	71.0	19	298	9.4	19
	10	15	9	0	24	26.4	399	47.9	24	304	8.5	24
	11	6	5	0	11	12.1	397	63.8	11	310	8.3	11
	12	0	1	0	1	1.1	490		1	300		1
	13											
	14											
	15											
Sample Total		51	40	0	91	100.0	331	89.6	91	289	21.5	91
	3											
	4	5	8	0	13	12.0	135	17.8	13	228	9.8	13
	5	22	21	0	43	39.8	175	27.0	43	247	8.3	43
	6	4	1	0	5	4.6	206	27.5	5	257	9.4	5
	7	11	10	0	21	19.4	259	35.7	21	273	9.6	21
	8	2	3	0	5	4.6	342	55.0	5	292	8.6	5
24 May	9	5	4	0	9	8.3	331	61.8	9	296	14.2	9
	10	4	2	0	6	5.6	361	50.9	6	305	9.5	6
	11	6	0	0	6	5.6	350	12.2	6	311	11.1	6
	12											
	13											
	14											
	15											
Sample Total		59	49	0	108	100.0	229	82.5	108	263	26.8	108

– continued –

Appendix A.10. (Page 2 of 2).

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4	6	8	0	14	3.9	147	50.4	14	228	9.4	14
	5	26	28	0	54	14.9	178	26.4	54	247	7.9	54
	6	6	2	0	8	2.2	227	39.7	8	262	11.9	8
	7	25	26	0	51	14.0	271	58.4	51	278	9.9	51
	8	8	10	0	18	5.0	319	61.5	18	290	9.7	18
13–24 May	9	26	28	0	54	14.9	357	79.3	54	299	10.8	54
	10	58	41	0	99	27.3	371	71.9	99	306	9.2	99
	11	30	20	0	50	13.8	369	77.9	50	312	10.2	50
	12	1	5	0	6	1.7	454	90.6	6	318	10.2	6
	13	7	1	0	8	2.2	394	81.1	8	319	12.8	8
	14	0	1	0	1	0.3	504		1	326		1
	15											
All Samples Combined		193	170	0	363	100.0	314	103.4	363	289	27.1	363
Sex Composition		53.2	46.8									
Unaged		18	21	0	39	10.7	314	110.7	39	287	34.6	39
Sex Composition		46.2	53.8									

Appendix A.11. Age, sex, and size composition of Pacific herring caught by test commercial purse seine, Togiak Section, 9–22 May 1988.

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5	4	2	0	6	14.3	182	36.7	6	236	9.8	6
	6											
	7	10	4	0	14	33.3	268	23.1	14	267	7.0	14
	8	3	1	0	4	9.5	286	25.3	4	272	5.3	4
9 May	9	5	6	0	11	26.2	353	46.9	11	284	9.2	11
	10	4	2	0	6	14.3	364	41.6	6	287	6.1	6
	11	0	1	0	1	2.4	426		1	309		1
	12											
	13											
	14											
	15											
Sample Total		26	16	0	42	100.0	297	72.7	42	271	18.9	42
	3											
	4											
	5	0	1	0	1	1.0	234		1	260		1
	6	1	1	0	2	2.0	273	24.0	2	269	9.9	2
	7	5	6	0	11	11.2	311	29.1	11	283	8.9	11
	8	4	0	0	4	4.1	328	40.7	4	292	8.2	4
13 May	9	11	16	0	27	27.6	403	42.9	27	300	9.1	27
	10	11	19	0	30	30.6	434	49.2	30	309	9.9	30
	11	4	13	0	17	17.3	457	46.6	17	312	6.7	17
	12	0	2	0	2	2.0	551	12.7	2	334	14.1	2
	13	0	2	0	2	2.0	543	18.4	2	319	1.4	2
	14	0	2	0	2	2.0	557	72.1	2	336	17.0	2
	15											
Sample Total		36	62	0	98	100.0	413	75.3	98	303	15.5	98
	3											
	4											
	5											
	6	1	0	0	1	0.9	294		1	274		1
	7	8	10	0	18	17.0	327	35.8	18	280	7.8	18
	8	2	4	0	6	5.7	385	61.5	6	292	9.8	6
14 May	9	12	15	0	27	25.5	405	55.2	27	300	8.3	27
	10	12	19	0	31	29.2	456	49.8	31	309	8.7	31
	11	7	13	0	20	18.9	467	44.4	20	310	9.8	20
	12	0	2	0	2	1.9	537	32.5	2	319	7.1	2
	13	0	1	0	1	0.9	466		1	314		1
	14											
	15											
Sample Total		42	64	0	106	100.0	419	71.2	106	301	14.1	106
	3											
	4											
	5	1	0	0	1	1.2	182		1	240		1
	6											
	7	1	2	0	3	3.6	313	54.9	3	279	11.0	3
	8	0	1	0	1	1.2	436		1	294		1
15 May	9	13	10	0	23	27.4	432	42.1	23	308	6.7	23
	10	18	24	0	42	50.0	429	46.1	42	306	6.6	42
	11	5	5	0	10	11.9	447	31.9	10	308	9.5	10
	12	2	0	0	2	2.4	461	38.2	2	316	2.8	2
	13	1	1	0	2	2.4	451	75.0	2	327	4.2	2
	14											
	15											
Sample Total		41	43	0	84	100.0	426	55.5	84	305	11.9	84

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Appendix A.11. (Page 2 of 3).

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4	0	1	0	1	0.9	132		1	224		1
	5	1	7	0	8	7.5	179	27.4	8	246	7.6	8
	6	2	1	0	3	2.8	217	100.3	3	264	8.7	3
	7	16	15	0	31	29.0	282	63.2	31	280	8.2	31
	8	2	7	0	9	8.4	249	93.1	9	293	7.6	9
16 May	9	5	9	0	14	13.1	398	48.8	14	302	8.4	14
	10	9	15	0	24	22.4	395	87.3	24	309	10.6	23
	11	5	11	0	16	15.0	401	78.7	16	304	12.2	16
	12	1	0	0	1	0.9	484		1	324		1
	13											
	14											
	15											
Sample Total		41	66	0	107	100.0	329	105.1	107	291	21.4	106
	3											
	4	0	1	0	1	1.3	136		1	220		1
	5	6	6	0	12	15.2	165	29.6	12	246	12.2	12
	6	3	1	0	4	5.1	201	30.7	4	260	4.9	4
	7	7	6	0	13	16.5	260	31.5	13	279	6.2	13
	8	3	3	0	6	7.6	280	47.5	6	285	12.4	6
19 May	9	6	3	0	9	11.4	308	24.8	9	299	5.9	9
	10	13	13	0	26	32.9	326	43.1	26	303	12.3	26
	11	6	0	0	6	7.6	359	52.5	6	311	10.6	6
	12	1	0	0	1	1.3	370		1	314		1
	13	1	0	0	1	1.3	346		1	318		1
	14											
	15											
Sample Total		46	33	0	79	100.0	280	73.6	79	286	25.2	79
	3											
	4	11	17	0	28	14.1	125	20.6	28	223	10.5	28
	5	17	32	0	49	24.7	159	26.5	49	238	8.6	49
	6	6	1	0	7	3.5	206	31.6	7	257	13.8	7
	7	8	19	0	27	13.6	240	36.2	27	274	12.4	27
	8	1	2	0	3	1.5	283	53.5	3	285	15.0	3
21 May	9	14	6	0	20	10.1	294	52.5	20	290	19.9	20
	10	15	13	0	28	14.1	331	43.5	28	301	9.5	28
	11	10	22	0	32	16.2	360	29.0	32	309	8.5	32
	12	1	2	0	3	1.5	356	11.1	3	315	6.4	3
	13											
	14	0	1	0	1	0.5	404		1	314		1
	15											
Sample Total		83	115	0	198	100.0	243	94.1	198	269	34.2	198
	3											
	4	7	6	0	13	12.0	128	13.8	13	226	4.3	13
	5	7	3	0	10	9.3	164	11.3	10	244	4.6	10
	6	2	2	0	4	3.7	186	32.3	4	257	16.6	4
	7	11	9	0	20	18.5	245	36.1	20	277	11.2	20
	8	1	1	0	2	1.9	277	21.2	2	286	2.8	2
22 May	9	10	8	0	18	16.7	326	27.2	18	302	7.5	18
	10	17	12	0	29	26.9	337	31.9	29	303	9.5	29
	11	6	5	0	11	10.2	351	48.1	11	308	11.6	11
	12											
	13	1	0	0	1	0.9	428		1	330		1
	14											
	15											
Sample Total		62	46	0	108	100.0	272	86.2	108	282	30.1	108

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Appendix A.11. (Page 3 of 3).

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4	18	25	0	43	5.2	126	18.3	43	224	8.9	43
	5	36	51	0	87	10.6	165	27.9	87	241	9.5	87
	6	15	6	0	21	2.6	213	50.2	21	260	11.9	21
	7	66	71	0	137	16.7	274	51.2	137	277	10.2	137
	8	16	19	0	35	4.3	301	77.9	35	288	10.8	35
9–22 May	9	76	73	0	149	18.1	374	65.6	149	299	12.1	149
	10	99	117	0	216	26.3	391	71.2	216	305	10.1	215
	11	43	70	0	113	13.7	407	66.1	113	309	9.6	113
	12	5	6	0	11	1.3	456	85.0	11	320	9.4	11
	13	3	4	0	7	0.9	461	75.2	7	322	6.2	7
	14	0	3	0	3	0.4	506	102.0	3	329	17.5	3
	15											
All Samples Combined		377	445	0	822	100.0	326	110.8	822	287	28.1	821
Sex Composition		45.9	54.1									
Unaged		43	40	0	83	10.1	321	109.7	83	291	26.7	83
Sex Composition		51.8	48.2									

Appendix A.12. Age, sex, and size composition of Pacific herring caught by test commercial purse seine, Hagemeister Section, 12–23 May 1988.

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5											
	6	1	0	0	1	1.4	264		1	268		1
	7	5	4	0	9	12.7	339	45.0	9	283	12.1	9
	8	1	4	0	5	7.0	344	18.7	5	279	4.4	5
12 May	9	7	5	0	12	16.9	392	41.9	12	293	9.8	12
	10	11	13	0	24	33.8	440	49.4	24	304	10.6	24
	11	6	7	0	13	18.3	473	45.7	13	310	6.9	13
	12	1	2	0	3	4.2	495	27.0	3	314	5.5	3
	13	2	1	0	3	4.2	486	68.1	3	317	9.9	3
	14	0	1	0	1	1.4	564		1	330		1
	15											
Sample Total		34	37	0	71	100.0	422	70.5	71	300	15.1	71
	3											
	4											
	5	0	1	0	1	0.7	298		1	276		1
	6	0	2	0	2	1.4	308	28.3	2	275	4.9	2
	7	8	13	0	21	14.2	323	39.0	21	275	9.8	21
	8	3	8	0	11	7.4	365	56.5	11	284	12.5	11
13 May	9	14	18	0	32	21.6	399	41.6	32	295	8.8	32
	10	16	27	0	43	29.1	433	48.2	43	299	8.5	43
	11	11	17	0	28	18.9	471	39.5	28	306	6.9	28
	12	1	6	0	7	4.7	512	30.4	7	314	7.3	7
	13	0	1	0	1	0.7	562		1	323		1
	14	1	1	0	2	1.4	536	87.7	2	321	12.0	2
	15											
Sample Total		54	94	0	148	100.0	416	70.8	148	296	14.4	148
	3											
	4	1	0	0	1	1.1	140		1	223		1
	5	3	2	0	5	5.3	180	55.0	5	238	20.6	5
	6	1	3	0	4	4.2	256	43.3	4	260	7.5	4
	7	9	7	0	16	16.8	314	40.9	16	273	8.6	16
	8	4	3	0	7	7.4	345	42.8	7	285	12.1	7
14 May	9	6	12	0	18	18.9	379	51.8	18	288	10.8	18
	10	12	7	0	19	20.0	432	35.7	19	300	7.6	19
	11	8	11	0	19	20.0	465	53.2	19	304	6.0	19
	12	3	0	1	4	4.2	439	46.7	4	312	4.9	4
	13	1	0	0	1	1.1	482		1	313		1
	14	0	1	0	1	1.1	599		1	330		1
	15											
Sample Total		48	46	1	95	100.0	381	94.5	95	288	21.4	95
	3											
	4											
	5	0	1	0	1	3.3	190		1	248		1
	6	2	0	0	2	6.7	280	45.3	2	267	9.2	2
	7	2	3	0	5	16.7	342	47.1	5	277	8.4	5
	8	1	0	0	1	3.3	340		1	277		1
15 May	9	0	1	0	1	3.3	430		1	296		1
	10	5	6	0	11	36.7	424	34.8	11	294	5.3	11
	11	4	5	0	9	30.0	446	40.7	9	298	6.6	9
	12											
	13											
	14											
	15											
Sample Total		14	16	0	30	100.0	397	73.2	30	289	14.0	30

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Appendix A.12. (Page 2 of 3).

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5	0	1	0	1	0.6	224		1	243		1
	6	1	1	0	2	1.3	250	45.3	2	256	12.7	2
	7	10	15	0	25	15.8	305	34.4	25	271	7.1	25
	8	2	9	0	11	7.0	348	37.7	11	278	7.2	11
16 May	9	17	20	0	37	23.4	397	53.1	37	287	7.9	37
	10	14	33	0	47	29.7	433	55.1	47	297	9.0	47
	11	10	20	0	30	19.0	466	48.7	30	302	9.1	30
	12	1	1	0	2	1.3	491	60.8	2	313	10.6	2
	13	2	1	0	3	1.9	468	62.1	3	319	9.7	3
	14	.										
	15											
Sample Total		57	101	0	158	100.0	402	75.9	158	290	15.2	158
	3											
	4	1	0	0	1	1.0	184		1	242		1
	5	4	5	0	9	8.8	170	17.6	9	230	8.9	9
	6	0	2	0	2	2.0	244	8.5	2	257	1.4	2
	7	11	8	0	19	18.6	290	38.6	19	271	6.4	19
	8	4	2	0	6	5.9	343	10.9	6	284	7.5	6
19 May	9	9	5	0	14	13.7	342	51.9	14	288	10.8	14
	10	11	17	0	28	27.5	370	57.1	28	296	9.6	28
	11	11	9	0	20	19.6	375	53.2	20	298	9.5	20
	12	1	1	0	2	2.0	432	2.8	2	312	13.4	2
	13	0	1	0	1	1.0	442		1	320		1
	14											
	15											
Sample Total		52	50	0	102	100.0	331	78.8	102	284	22.5	102
	3											
	4	8	13	0	21	25.6	141	20.7	21	220	7.6	21
	5	20	10	0	30	36.6	173	20.9	30	233	6.8	30
	6	1	2	0	3	3.7	203	2.3	3	249	7.0	3
	7	3	1	0	4	4.9	258	33.6	4	261	9.8	4
	8	2	0	0	2	2.4	266	42.4	2	262	13.4	2
20 May	9	1	1	0	2	2.4	332	31.1	2	291	7.8	2
	10	8	2	0	10	12.2	332	31.8	10	293	10.6	10
	11	3	4	0	7	8.5	365	41.0	7	298	6.1	7
	12											
	13	1	1	0	2	2.4	355	1.4	2	304	0.0	2
	14	0	1	0	1	1.2	442		1	318		1
	15											
Sample Total		47	35	0	82	100.0	220	88.6	82	250	31.3	82
	3											
	4	5	7	0	12	13.3	164	47.3	12	229	20.5	12
	5	12	2	0	14	15.6	182	21.4	14	238	9.4	14
	6	0	1	0	1	1.1	182		1	234		1
	7	12	9	0	21	23.3	273	24.8	21	269	7.1	21
	8	0	2	0	2	2.2	292	50.9	2	280	17.7	2
21 May	9	5	6	0	11	12.2	361	27.6	11	294	6.7	11
	10	11	3	0	14	15.6	362	31.0	14	301	7.0	14
	11	6	4	0	10	11.1	380	40.0	10	305	10.1	10
	12	2	0	0	2	2.2	405	86.3	2	307	10.6	2
	13	0	2	0	2	2.2	389	4.2	2	312	7.1	2
	14	0	1	0	1	1.1	392		1	304		1
	15											
Sample Total		53	37	0	90	100.0	287	90.1	90	273	30.7	90

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Appendix A.12. (Page 3 of 3).

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4	5	2	0	7	8.1	141	11.2	7	226	3.3	7
	5	5	5	0	10	11.6	188	18.3	10	242	6.1	10
	6	1	3	0	4	4.7	242	36.2	4	256	11.2	4
	7	12	8	0	20	23.3	282	26.4	20	272	8.0	20
	8	1	1	0	2	2.3	323	41.0	2	288	2.8	2
22 May	9	12	2	0	14	16.3	326	56.4	14	291	9.5	14
	10	12	4	0	16	18.6	352	52.6	16	298	12.6	16
	11	6	6	0	12	14.0	394	84.3	12	306	9.6	12
	12	0	1	0	1	1.2	376		1	314		1
	13											
	14											
	15											
Sample Total		54	32	0	86	100.0	296	88.7	86	278	26.5	86
	3											
	4	1	1	0	2	4.1	108	8.5	2	201	0.7	2
	5	6	6	0	12	24.5	173	21.1	12	241	8.2	12
	6											
	7	4	4	0	8	16.3	252	20.6	8	269	7.3	8
	8	2	2	0	4	8.2	256	17.2	4	273	6.7	4
23 May	9	0	4	0	4	8.2	328	75.5	4	294	18.9	4
	10	8	4	0	12	24.5	349	48.0	12	296	10.6	12
	11	1	4	0	5	10.2	363	39.9	5	301	7.1	5
	12	0	1	0	1	2.0	420		1	316		1
	13	0	1	0	1	2.0	318		1	301		1
	14											
	15											
Sample Total		22	27	0	49	100.0	273	89.1	49	273	29.5	49
	3											
	4	21	23	0	44	4.8	147	31.6	44	223	13.5	44
	5	50	33	0	83	9.1	179	27.2	83	237	10.4	83
	6	7	14	0	21	2.3	248	41.8	21	258	11.3	21
	7	76	72	0	148	16.2	298	41.6	148	272	8.9	148
	8	20	31	0	51	5.6	337	48.6	51	281	10.5	51
12–23 May	9	71	74	0	145	15.9	377	54.5	145	291	9.7	145
	10	108	116	0	224	24.6	406	60.7	224	298	9.5	224
	11	66	87	0	153	16.8	435	65.2	153	303	8.6	153
	12	9	12	1	22	2.4	467	56.1	22	313	6.8	22
	13	6	8	0	14	1.5	440	76.9	14	314	8.8	14
	14	1	5	0	6	0.7	512	87.6	6	321	11.0	6
	15											
All Samples Combined		435	475	1	911	100.0	351	104.6	911	283	25.9	911
Sex Composition		47.8	52.2									
Unaged		71	98	0	169	18.6	362	96.3	169	285	27.1	168
Sex Composition		42.0	58.0									

Appendix A.13. Age, sex, and size composition of Pacific herring caught by test commercial purse seine, Pyrite Point Section, 19 May 1988.

		Sex (number)				Percent of	Weight			Length		
Sample Dates	Age	Male	Female	Unknown	Total	Total	Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	3											
	4											
	5	0	1	0	1	1.1	208		1	258		1
	6											
	7	9	7	0	16	17.8	288	35.8	16	276	6.6	16
	8	5	2	0	7	7.8	341	74.1	7	285	9.0	7
19 May	9	8	5	0	13	14.4	368	49.6	13	295	13.0	13
	10	16	17	0	33	36.7	386	45.0	33	299	7.9	33
	11	10	6	0	16	17.8	397	60.3	16	303	10.4	16
	12	1	2	0	3	3.3	493	41.3	3	324	2.0	3
	13	0	1	0	1	1.1	516		1	322		1
	14											
	15											
Sample Total		49	41	0	90	100.0	368	69.7	90	294	14.8	90
Sex Composition		54.4	45.6									
Unaged		4	5	0	9	10.0	352	70.4	9	286	14.2	9
Sex Composition		44.4	55.6									

Appendix A.14. Age, sex, and size composition of Pacific herring caught by test commercial purse seine, Cape Newenham Section, 17 May 1988.

		Sex (number)				Percent of	Weight			Length		
Sample Dates	Age	Male	Female	Unknown	Total	Total	Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	3											
	4											
	5											
	6											
	7											
	8	1	1	0	2	7.7	373	7.1	2	284	9.2	2
17 May	9	2	2	0	4	15.4	385	15.7	4	279	23.6	4
	10	7	6	0	13	50.0	427	43.4	13	300	6.5	13
	11	2	4	0	6	23.1	456	36.6	6	303	8.0	6
	12	0	1	0	1	3.8	502		1	323		1
	13											
	14											
	15											
Sample Total		12	14	0	26	100.0	426	46.3	26	297	14.5	26
Sex Composition		46.2	53.8									
Unaged		1	3	0	4	15.4	411	38.7	4	296	4.8	4
Sex Composition		25.0	75.0									

Appendix A.15. Age, sex, and size composition of Pacific herring caught by test commercial purse seine, Kulukak, Nunavachak, Togiak, Hagemeister, Pyrite Point, and Cape Newenham Sections combined, 9–24 May 1988.

		Sex (number)				Percent	Weight			Length		
Sample Dates	Age	Male	Female	Unknown	Total	of Total	Mean (g)	SD	Number Weighed	Mean (mm)	SD	Number Measured
	3											
	4											
	5	4	2	0	6	14.3	182	36.7	6	236	9.8	6
	6											
	7	10	4	0	14	33.3	268	23.1	14	267	7.0	14
	8	3	1	0	4	9.5	286	25.3	4	272	5.3	4
9 May	9	5	6	0	11	26.2	353	46.9	11	284	9.2	11
	10	4	2	0	6	14.3	364	41.6	6	287	6.1	6
	11	0	1	0	1	2.4	426		1	309		1
	12											
	13											
	14											
	15											
Sample Total		26	16	0	42	100.0	297	72.7	42	271	18.9	42
	3											
	4											
	5											
	6	1	0	0	1	1.4	264		1	268		1
	7	5	4	0	9	12.7	339	45.0	9	283	12.1	9
	8	1	4	0	5	7.0	344	18.7	5	279	4.4	5
12 May	9	7	5	0	12	16.9	392	41.9	12	293	9.8	12
	10	11	13	0	24	33.8	440	49.4	24	304	10.6	24
	11	6	7	0	13	18.3	473	45.7	13	310	6.9	13
	12	1	2	0	3	4.2	495	27.0	3	314	5.5	3
	13	2	1	0	3	4.2	486	68.1	3	317	9.9	3
	14	0	1	0	1	1.4	564		1	330		1
	15											
Sample Total		34	37	0	71	100.0	422	70.5	71	300	15.1	71
	3											
	4											
	5	0	2	0	2	0.6	266	45.3	2	268	11.3	2
	6	2	4	0	6	1.8	287	23.4	6	273	7.8	6
	7	14	23	0	37	11.4	322	36.0	37	279	10.2	37
	8	11	10	0	21	6.5	350	49.3	21	287	10.5	21
13 May	9	31	43	0	74	22.8	400	43.2	74	297	9.2	74
	10	49	58	0	107	32.9	426	47.0	107	303	9.2	107
	11	23	34	0	57	17.5	459	43.8	57	309	8.0	57
	12	1	10	0	11	3.4	518	29.9	11	319	10.9	11
	13	2	3	0	5	1.5	516	60.7	5	318	12.8	5
	14	1	4	0	5	1.5	538	60.8	5	328	13.0	5
	15											
Sample Total		134	191	0	325	100.0	412	69.1	325	300	14.7	325
	3											
	4	1	0	0	1	0.5	140		1	223		1
	5	3	2	0	5	2.5	180	55.0	5	238	20.6	5
	6	2	3	0	5	2.5	263	41.3	5	263	8.9	5
	7	17	17	0	34	16.9	321	38.2	34	277	8.8	34
	8	6	7	0	13	6.5	364	54.2	13	288	11.2	13
14 May	9	18	27	0	45	22.4	395	54.8	45	295	11.0	45
	10	24	26	0	50	24.9	447	46.1	50	306	9.3	50
	11	15	24	0	39	19.4	466	48.2	39	307	8.6	39
	12	3	2	1	6	3.0	471	64.1	6	314	6.3	6
	13	1	1	0	2	1.0	474	11.3	2	314	0.7	2
	14	0	1	0	1	0.5	599		1	330		1
	15											
Sample Total		90	110	1	201	100.0	401	85.0	201	295	19.0	201

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Appendix A.15. (Page 2 of 4).

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5	1	1	0	2	1.7	186	5.7	2	244	5.7	2
	6	2	0	0	2	1.7	280	45.3	2	267	9.2	2
	7	3	5	0	8	7.0	332	48.6	8	278	8.7	8
	8	1	1	0	2	1.7	388	67.9	2	286	12.0	2
15 May	9	13	11	0	24	20.9	432	41.2	24	307	7.0	24
	10	24	30	0	54	47.0	428	43.3	54	313	72.2	54
	11	9	10	0	19	16.5	447	35.3	19	304	9.5	19
	12	2	0	0	2	1.7	461	38.2	2	316	2.8	2
	13	1	1	0	2	1.7	451	75.0	2	327	4.2	2
	14											
	15											
Sample Total		56	59	0	115	100.0	419	61.4	115	306	51.5	115
	3											
	4	0	1	0	1	0.3	132		1	224		1
	5	1	8	0	9	2.6	184	29.7	9	246	7.2	9
	6	3	2	0	5	1.4	230	76.6	5	261	9.9	5
	7	28	34	0	62	17.7	287	62.2	62	277	9.0	62
	8	4	19	0	23	6.6	298	86.5	23	287	11.2	23
16 May	9	26	36	0	62	17.7	387	70.8	62	293	11.5	62
	10	40	66	0	106	30.3	385	87.3	106	305	11.5	105
	11	25	42	0	67	19.1	406	91.0	67	306	11.5	67
	12	3	3	0	6	1.7	448	90.5	6	319	8.6	6
	13	7	2	0	9	2.6	403	82.0	9	320	9.3	9
	14											
	15											
Sample Total		137	213	0	350	100.0	360	97.7	350	295	18.7	349
	3											
	4											
	5											
	6											
	7											
	8	1	1	0	2	7.7	373	7.1	2	284	9.2	2
17 May	9	2	2	0	4	15.4	385	15.7	4	279	23.6	4
	10	7	6	0	13	50.0	427	43.4	13	300	6.5	13
	11	2	4	0	6	23.1	456	36.6	6	303	8.0	6
	12	0	1	0	1	3.8	502		1	323		1
	13											
	14											
	15											
Sample Total		12	14	0	26	100.0	426	46.3	26	297	14.5	26
	3											
	4	1	1	0	2	0.7	160	33.9	2	231	15.6	2
	5	10	12	0	22	8.1	169	25.7	22	240	13.5	22
	6	3	3	0	6	2.2	215	32.9	6	259	4.1	6
	7	27	21	0	48	17.7	281	37.4	48	275	7.0	48
	8	12	7	0	19	7.0	322	58.1	19	285	9.3	19
19 May	9	23	13	0	36	13.3	342	50.3	36	294	11.3	36
	10	40	47	0	87	32.1	363	54.4	87	299	10.2	87
	11	27	15	0	42	15.5	381	56.2	42	302	10.6	42
	12	3	3	0	6	2.2	452	56.7	6	318	8.9	6
	13	1	2	0	3	1.1	435	85.2	3	320	2.0	3
	14											
	15											
Sample Total		147	124	0	271	100.0	328	81.8	271	288	21.6	271

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Appendix A.15. (Page 3 of 4).

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4	9	13	0	22	12.7	149	41.7	22	221	7.7	22
	5	24	17	0	41	23.7	176	22.0	41	238	9.6	41
	6	2	2	0	4	2.3	207	8.9	4	252	7.9	4
	7	14	9	0	23	13.3	275	46.7	23	276	10.9	23
	8	4	2	0	6	3.5	295	41.0	6	274	12.2	6
20 May	9	12	9	0	21	12.1	347	67.9	21	297	9.4	21
	10	23	11	0	34	19.7	379	53.2	34	300	10.3	34
	11	9	9	0	18	10.4	384	57.0	18	305	9.6	18
	12	0	1	0	1	0.6	490		1	300		1
	13	1	1	0	2	1.2	355	1.4	2	304	0.0	2
	14	0	1	0	1	0.6	442		1	318		1
	15											
Sample Total		98	75	0	173	100.0	278	105.0	173	270	33.1	173
	3											
	4	16	24	0	40	13.9	137	35.4	40	225	14.2	40
	5	29	34	0	63	21.9	164	27.1	63	238	8.7	63
	6	6	2	0	8	2.8	203	30.4	8	254	15.1	8
	7	20	28	0	48	16.7	255	35.4	48	272	10.6	48
	8	1	4	0	5	1.7	286	45.9	5	283	14.1	5
21 May	9	19	12	0	31	10.8	318	55.4	31	292	16.4	31
	10	26	16	0	42	14.6	341	41.9	42	301	8.6	42
	11	16	26	0	42	14.6	365	32.6	42	308	8.9	42
	12	3	2	0	5	1.7	376	51.4	5	312	8.5	5
	13	0	2	0	2	0.7	389	4.2	2	312	7.1	2
	14	0	2	0	2	0.7	398	8.5	2	309	7.1	2
	15											
Sample Total		136	152	0	288	100.0	257	94.9	288	271	33.1	288
	3											
	4	12	8	0	20	10.3	132	14.4	20	226	3.9	20
	5	12	8	0	20	10.3	176	19.3	20	243	5.3	20
	6	3	5	0	8	4.1	214	43.6	8	256	13.1	8
	7	23	17	0	40	20.6	264	36.5	40	275	9.9	40
	8	2	2	0	4	2.1	300	37.6	4	287	2.6	4
22 May	9	22	10	0	32	16.5	326	41.7	32	297	10.0	32
	10	29	16	0	45	23.2	342	40.5	45	301	10.9	45
	11	12	11	0	23	11.9	373	71.3	23	307	10.4	23
	12	0	1	0	1	0.5	376		1	314		1
	13	1	0	0	1	0.5	428		1	330		1
	14											
	15											
Sample Total		116	78	0	194	100.0	283	87.8	194	280	28.6	194
	3											
	4	13	11	0	24	16.6	135	18.2	24	228	10.9	24
	5	23	29	0	52	35.9	173	20.4	52	244	8.2	52
	6	2	4	0	6	4.1	216	46.0	6	262	17.9	6
	7	10	6	0	16	11.0	248	35.0	16	273	9.9	16
	8	5	2	0	7	4.8	283	36.9	7	282	12.8	7
23 May	9	4	5	0	9	6.2	331	59.6	9	297	18.0	9
	10	18	4	0	22	15.2	341	52.1	22	299	9.8	22
	11	2	5	0	7	4.8	378	43.1	7	304	7.2	7
	12	0	1	0	1	0.7	420		1	316		1
	13	0	1	0	1	0.7	318		1	301		1
	14											
	15											
Sample Total		77	68	0	145	100.0	230	89.0	145	262	29.0	145

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Appendix A.15. (Page 4 of 4).

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4	5	8	0	13	12.0	135	17.8	13	228	9.8	13
	5	22	21	0	43	39.8	175	27.0	43	247	8.3	43
	6	4	1	0	5	4.6	206	27.5	5	257	9.4	5
	7	11	10	0	21	19.4	259	35.7	21	273	9.6	21
	8	2	3	0	5	4.6	342	55.0	5	292	8.6	5
24 May	9	5	4	0	9	8.3	331	61.8	9	296	14.2	9
	10	4	2	0	6	5.6	361	50.9	6	305	9.5	6
	11	6	0	0	6	5.6	350	12.2	6	311	11.1	6
	12											
	13											
	14	.										
	15											
Sample Total		59	49	0	108	100.0	229	82.5	108	263	26.8	108
	3											
	4	57	66	0	123	5.3	138	29.6	123	225	10.8	123
	5	129	136	0	265	11.5	173	26.9	265	242	10.1	265
	6	30	26	0	56	2.4	228	46.9	56	260	12.1	56
	7	182	178	0	360	15.6	283	49.6	360	275	9.8	360
	8	53	63	0	116	5.0	323	63.0	116	285	10.9	116
9–24 May	9	187	183	0	370	16.0	372	63.0	370	295	12.0	370
	10	299	297	0	596	25.8	393	67.1	596	303	23.9	595
	11	152	188	0	340	14.7	414	70.5	340	306	9.8	340
	12	16	26	1	43	1.9	465	66.9	43	316	8.6	43
	13	16	14	0	30	1.3	435	79.2	30	317	9.7	30
	14	1	9	0	10	0.4	509	81.2	10	324	12.3	10
	15											
All Samples Combined		1,122	1,186	1	2,309	100.0	332	108.8	2,309	285	29.6	2,308
Sex Composition		48.6	51.4									
Unaged		138	176	0	314	13.6	341	105.1	314	286	28.4	313
Sex Composition		43.9	56.1									

Appendix A.16. Age, sex, and size composition of Pacific herring caught by test commercial gillnet, Kulukak Section, 4–21 May 1988.

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5											
	6											
	7											
	8	1	0	0	1	20.0	328		1	288		1
4 May	9	1	0	0	1	20.0	346		1	285		1
	10	0	3	0	3	60.0	401	51.4	3	293	11.8	3
	11											
	12											
	13											
	14											
	15											
Sample Total		2	3	0	5	100.0	375	50.8	5	290	9.1	5
	3											
	4											
	5	1	0	0	1	8.3	194		1	242		1
	6											
	7	2	2	0	4	33.3	277	18.3	4	269	7.2	4
	8	1	1	0	2	16.7	331	15.6	2	280	0.0	2
5 May	9	2	2	0	4	33.3	307	27.2	4	281	8.1	4
	10	0	1	0	1	8.3	444		1	300		1
	11											
	12											
	13											
	14											
	15											
Sample Total		6	6	0	12	100.0	303	60.1	12	275	14.9	12
	3											
	4											
	5	0	2	0	2	7.1	241	4.2	2	250	7.1	2
	6	1	3	0	4	14.3	277	20.6	4	268	6.7	4
	7	7	3	0	10	35.7	296	41.2	10	275	10.9	10
	8	1	2	0	3	10.7	307	90.3	3	278	12.6	3
7 May	9	4	1	0	5	17.9	306	50.3	5	276	10.2	5
	10	2	2	0	4	14.3	385	62.1	4	289	12.3	4
	11											
	12											
	13											
	14											
	15											
Sample Total		15	13	0	28	100.0	305	58.5	28	275	13.1	28
	3											
	4											
	5	1	0	0	1	10.0	306		1	278		1
	6											
	7	0	1	0	1	10.0	308		1	266		1
	8	1	1	0	2	20.0	340	14.1	2	279	1.4	2
9 May	9	2	1	0	3	30.0	352	77.9	3	285	15.5	3
	10	2	1	0	3	30.0	371	16.8	3	292	6.1	3
	11											
	12											
	13											
	14											
	15											
Sample Total		6	4	0	10	100.0	346	44.8	10	283	11.4	10

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Appendix A.16. (Page 2 of 3).

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5											
	6	0	1	0	1	6.3	313		1	272		1
	7	3	2	0	5	31.3	265	24.6	5	263	8.5	5
	8	2	2	0	4	25.0	319	9.8	4	277	3.7	4
11 May	9	3	0	0	3	18.8	341	49.2	3	287	6.4	3
	10	3	0	0	3	18.8	373	45.9	3	290	13.1	3
	11											
	12											
	13											
	14											
	15											
Sample Total		11	5	0	16	100.0	316	49.2	16	276	13.1	16
	3											
	4											
	5	1	2	0	3	5.5	297	27.3	3	278	7.4	3
	6	2	4	0	6	10.9	249	22.2	6	265	11.2	6
	7	7	7	0	14	25.5	296	45.7	14	274	9.0	14
	8	10	7	0	17	30.9	305	41.3	17	279	9.9	17
12 May	9	4	5	0	9	16.4	363	48.6	9	292	11.5	9
	10	2	4	0	6	10.9	437	49.2	6	305	6.9	6
	11											
	12											
	13											
	14											
	15											
Sample Total		26	29	0	55	100.0	320	65.6	55	281	14.6	55
	3											
	4	0	1	0	1	1.4	270		1	268		1
	5	1	0	0	1	1.4	334		1	290		1
	6	1	1	0	2	2.8	256	0.0	2	265	0.7	2
	7	4	11	0	15	20.8	306	36.1	15	278	7.4	15
	8	7	3	0	10	13.9	345	31.0	10	291	10.6	10
13 May	9	11	9	0	20	27.8	405	61.2	20	303	12.1	20
	10	10	12	0	22	30.6	439	54.3	22	308	11.4	22
	11	1	0	0	1	1.4	468		1	322		1
	12											
	13											
	14											
	15											
Sample Total		35	37	0	72	100.0	380	74.8	72	296	16.8	72
	3											
	4											
	5											
	6	1	0	0	1	4.0	236		1	264		1
	7											
	8	1	3	0	4	16.0	352	15.9	4	289	9.8	4
14 May	9	2	4	0	6	24.0	405	49.0	6	296	6.4	6
	10	4	4	0	8	32.0	424	26.0	8	300	3.6	8
	11	1	2	0	3	12.0	425	46.2	3	298	1.7	3
	12	1	2	0	3	12.0	506	62.4	3	317	8.3	3
	13											
	14											
	15											
Sample Total		10	15	0	25	100.0	410	65.6	25	298	11.8	25

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Appendix A.16. (Page 3 of 3).

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5											
	6	1	0	0	1	2.4	232		1	250		1
	7	2	5	0	7	16.7	325	13.8	7	281	7.3	7
	8	2	0	0	2	4.8	336	48.1	2	288	14.8	2
15 May	9	5	6	0	11	26.2	402	62.2	11	299	9.0	11
	10	8	8	0	16	38.1	416	31.6	16	302	4.9	16
	11	3	2	0	5	11.9	395	32.5	5	302	6.5	5
	12											
	13											
	14											
	15											
Sample Total		21	21	0	42	100.0	386	57.2	42	296	12.7	42
	3											
	4											
	5	1	0	0	1	3.8	176		1	235		1
	6											
	7	1	4	0	5	19.2	311	25.7	5	276	3.0	5
	8	0	1	0	1	3.8	338		1	280		1
16 May	9	5	2	0	7	26.9	411	41.4	7	296	7.0	7
	10	5	5	0	10	38.5	421	57.2	10	299	10.5	10
	11	2	0	0	2	7.7	428	39.6	2	306	1.4	2
	12											
	13											
	14											
	15											
Sample Total		14	12	0	26	100.0	385	74.4	26	291	16.8	26
	3											
	4											
	5	0	1	0	1	1.6	248		1	255		1
	6	0	1	0	1	1.6	234		1	255		1
	7	2	7	0	9	14.8	287	26.5	9	280	8.8	9
	8	2	1	0	3	4.9	347	57.1	3	290	17.7	3
21 May	9	5	5	0	10	16.4	348	48.2	10	297	11.7	10
	10	12	17	0	29	47.5	352	43.0	29	301	8.8	29
	11	6	2	0	8	13.1	361	22.1	8	303	5.7	8
	12											
	13											
	14											
	15											
Sample Total		27	34	0	61	100.0	339	48.5	61	296	14.0	61
	3											
	4	0	1	0	1	0.3	270		1	268		1
	5	5	5	0	10	2.8	263	53.0	10	263	19.4	10
	6	6	10	0	16	4.5	258	26.4	16	265	8.9	16
	7	28	42	0	70	19.9	298	35.9	70	275	9.3	70
	8	28	21	0	49	13.9	326	40.7	49	283	10.8	49
4–21 May	9	44	35	0	79	22.4	377	61.7	79	295	12.6	79
	10	48	57	0	105	29.8	402	56.1	105	301	10.0	105
	11	13	6	0	19	5.4	393	42.8	19	303	6.9	19
	12	1	2	0	3	0.9	506	62.4	3	317	8.3	3
	13											
	14											
	15											
All Samples Combined		173	179	0	352	100.0	354	70.5	352	290	16.5	352
Sex Composition		49.1	50.9									
Unaged		28	34	0	62	17.6	362	72.7	62	292	16.3	62
Sex Composition		45.2	54.8									

Appendix A.17. Age, sex, and size composition of Pacific herring caught by test commercial gillnet, Nunavachak Section, 6–15 May 1988.

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5											
	6											
	7											
	8											
6 May	9	1	2	0	3	100.0	393	11.0	3	294	6.5	3
	10											
	11											
	12											
	13											
	14											
	15											
Sample Total		1	2	0	3	100.0	393	11.0	3	294	6.5	3
	3											
	4											
	5											
	6	0	1	0	1	3.8	222		1	264		1
	7	3	3	0	6	23.1	325	19.1	6	282	8.1	6
	8	2	1	0	3	11.5	320	19.7	3	285	8.3	3
12 May	9	6	2	0	8	30.8	327	22.9	8	287	5.6	8
	10	6	0	0	6	23.1	347	41.0	6	298	4.6	6
	11	1	1	0	2	7.7	376	43.1	2	306	5.7	2
	12											
	13											
	14											
	15											
Sample Total		18	8	0	26	100.0	330	37.1	26	289	10.7	26
	3											
	4											
	5											
	6											
	7	0	3	0	3	15.8	341	32.1	3	283	8.1	3
	8	0	2	0	2	10.5	294	65.1	2	285	21.2	2
15 May	9	1	3	0	4	21.1	410	46.4	4	300	11.8	4
	10	3	3	0	6	31.6	378	64.8	6	301	12.6	6
	11	2	2	0	4	21.1	437	40.7	4	309	5.8	4
	12											
	13											
	14											
	15											
Sample Total		6	13	0	19	100.0	382	64.3	19	298	13.9	19
	3											
	4											
	5											
	6	0	1	0	1	2.1	222		1	264		1
	7	3	6	0	9	18.8	330	23.3	9	282	7.6	9
	8	2	3	0	5	10.4	310	38.2	5	285	12.1	5
6–15 May	9	8	7	0	15	31.3	362	48.0	15	292	9.1	15
	10	9	3	0	12	25.0	362	54.3	12	299	9.2	12
	11	3	3	0	6	12.5	417	48.7	6	308	5.4	6
	12											
	13											
	14											
	15											
All Samples Combined		25	23	0	48	100.0	355	55.4	48	292	12.5	48
Sex Composition		52.1	47.9									
Unaged		9	4	0	13	27.1	356	70.8	13	291	17.1	13
Sex Composition		69.2	30.8									

Appendix A.18. Age, sex, and size composition of Pacific herring caught by test commercial gillnet, Togiak Section, 8–12 May 1988.

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5											
	6											
	7	1	1	0	2	25.0	294	22.6	2	270	0.7	2
	8	1	0	0	1	12.5	368		1	304		1
8 May	9	4	0	0	4	50.0	363	60.7	4	295	10.2	4
	10	1	0	0	1	12.5	380		1	292		1
	11											
	12											
	13											
	14											
	15											
Sample Total		7	1	0	8	100.0	348	53.0	8	289	14.3	8
	3											
	4											
	5											
	6											
	7											
	8											
12 May	9	0	1	0	1	100.0	358		1	292		1
	10											
	11											
	12											
	13											
	14											
	15											
Sample Total		0	1	0	1	100.0	358		1	292		1
	3											
	4											
	5											
	6											
	7	1	1	0	2	22.2	294	22.6	2	270	0.7	2
	8	1	0	0	1	11.1	368		1	304		1
8–12 May	9	4	1	0	5	55.6	362	52.6	5	294	8.9	5
	10	1	0	0	1	11.1	380		1	292		1
	11											
	12											
	13											
	14											
	15											
All Samples Combined		7	2	0	9	100.0	349	49.7	9	290	13.4	9
Sex Composition		77.8	22.2									
Unaged		1	0	0	1	11.1	295		1	275		1
Sex Composition		100.0	0.0									

Appendix A.19. Age, sex, and size composition of Pacific herring caught by test commercial gillnet, Kulukak, Nunavachak, and Togiak Sections combined, 4–21 May 1988.

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5											
	6											
	7											
	8	1	0	0	1	20.0	328		1	288		1
4 May	9	1	0	0	1	20.0	346		1	285		1
	10	0	3	0	3	60.0	401	51.4	3	293	11.8	3
	11											
	12											
	13											
	14											
	15											
Sample Total		2	3	0	5	100.0	375	50.8	5	290	9.1	5
	3											
	4											
	5	1	0	0	1	8.3	194		1	242		1
	6											
	7	2	2	0	4	33.3	277	18.3	4	269	7.2	4
	8	1	1	0	2	16.7	331	15.6	2	280	0.0	2
5 May	9	2	2	0	4	33.3	307	27.2	4	281	8.1	4
	10	0	1	0	1	8.3	444		1	300		1
	11											
	12											
	13											
	14											
	15											
Sample Total		6	6	0	12	100.0	303	60.1	12	275	14.9	12
	3											
	4											
	5											
	6											
	7											
	8											
6 May	9	1	2	0	3	100.0	393	11.0	3	294	6.5	3
	10											
	11											
	12											
	13											
	14											
	15											
Sample Total		1	2	0	3	100.0	393	11.0	3	294	6.5	3
	3											
	4											
	5	0	2	0	2	7.1	241	4.2	2	250	7.1	2
	6	1	3	0	4	14.3	277	20.6	4	268	6.7	4
	7	7	3	0	10	35.7	296	41.2	10	275	10.9	10
	8	1	2	0	3	10.7	307	90.3	3	278	12.6	3
7 May	9	4	1	0	5	17.9	306	50.3	5	276	10.2	5
	10	2	2	0	4	14.3	385	62.1	4	289	12.3	4
	11											
	12											
	13											
	14											
	15											
Sample Total		15	13	0	28	100.0	305	58.5	28	275	13.1	28

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Appendix A.19. (Page 2 of 4).

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5											
	6											
	7	1	1	0	2	25.0	294	22.6	2	270	0.7	2
	8	1	0	0	1	12.5	368		1	304		1
8 May	9	4	0	0	4	50.0	363	60.7	4	295	10.2	4
	10	1	0	0	1	12.5	380		1	292		1
	11											
	12											
	13											
	14											
	15											
Sample Total		7	1	0	8	100.0	348	53.0	8	289	14.3	8
	3											
	4											
	5	1	0	0	1	10.0	306		1	278		1
	6											
	7	0	1	0	1	10.0	308		1	266		1
	8	1	1	0	2	20.0	340	14.1	2	279	1.4	2
9 May	9	2	1	0	3	30.0	352	77.9	3	285	15.5	3
	10	2	1	0	3	30.0	371	16.8	3	292	6.1	3
	11											
	12											
	13											
	14											
	15											
Sample Total		6	4	0	10	100.0	346	44.8	10	283	11.4	10
	3											
	4											
	5											
	6	0	1	0	1	6.3	313		1	272		1
	7	3	2	0	5	31.3	265	24.6	5	263	8.5	5
	8	2	2	0	4	25.0	319	9.8	4	277	3.7	4
11 May	9	3	0	0	3	18.8	341	49.2	3	287	6.4	3
	10	3	0	0	3	18.8	373	45.9	3	290	13.1	3
	11											
	12											
	13											
	14											
	15											
Sample Total		11	5	0	16	100.0	316	49.2	16	276	13.1	16
	3											
	4											
	5	1	2	0	3	3.7	297	27.3	3	278	7.4	3
	6	2	5	0	7	8.5	245	22.6	7	265	10.3	7
	7	10	10	0	20	24.4	305	41.5	20	276	9.3	20
	8	12	8	0	20	24.4	308	38.9	20	280	9.7	20
12 May	9	10	8	0	18	22.0	347	40.9	18	290	9.1	18
	10	8	4	0	12	14.6	392	64.0	12	301	6.7	12
	11	1	1	0	2	2.4	376	43.1	2	306	5.7	2
	12											
	13											
	14											
	15											
Sample Total		44	38	0	82	100.0	324	57.7	82	284	13.8	82

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Appendix A.19. (Page 3 of 4).

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4	0	1	0	1	1.4	270		1	268		1
	5	1	0	0	1	1.4	334		1	290		1
	6	1	1	0	2	2.8	256	0.0	2	265	0.7	2
	7	4	11	0	15	20.8	306	36.1	15	278	7.4	15
	8	7	3	0	10	13.9	345	31.0	10	291	10.6	10
13 May	9	11	9	0	20	27.8	405	61.2	20	303	12.1	20
	10	10	12	0	22	30.6	439	54.3	22	308	11.4	22
	11	1	0	0	1	1.4	468		1	322		1
	12											
	13											
	14											
	15											
Sample Total		35	37	0	72	100.0	380	74.8	72	296	16.8	72
	3											
	4											
	5											
	6	1	0	0	1	4.0	236		1	264		1
	7											
	8	1	3	0	4	16.0	352	15.9	4	289	9.8	4
14 May	9	2	4	0	6	24.0	405	49.0	6	296	6.4	6
	10	4	4	0	8	32.0	424	26.0	8	300	3.6	8
	11	1	2	0	3	12.0	425	46.2	3	298	1.7	3
	12	1	2	0	3	12.0	506	62.4	3	317	8.3	3
	13											
	14											
	15											
Sample Total		10	15	0	25	100.0	410	65.6	25	298	11.8	25
	3											
	4											
	5											
	6	1	0	0	1	1.6	232		1	250		1
	7	2	8	0	10	16.4	329	20.4	10	281	7.1	10
	8	2	2	0	4	6.6	315	52.6	4	286	15.0	4
15 May	9	6	9	0	15	24.6	404	56.9	15	299	9.4	15
	10	11	11	0	22	36.1	406	44.8	22	302	7.5	22
	11	5	4	0	9	14.8	414	40.6	9	305	6.9	9
	12											
	13											
	14											
	15											
Sample Total		27	34	0	61	100.0	385	59.0	61	296	13.0	61
	3											
	4											
	5	1	0	0	1	3.8	176		1	235		1
	6											
	7	1	4	0	5	19.2	311	25.7	5	276	3.0	5
	8	0	1	0	1	3.8	338		1	280		1
16 May	9	5	2	0	7	26.9	411	41.4	7	296	7.0	7
	10	5	5	0	10	38.5	421	57.2	10	299	10.5	10
	11	2	0	0	2	7.7	428	39.6	2	306	1.4	2
	12											
	13											
	14											
	15											
Sample Total		14	12	0	26	100.0	385	74.4	26	291	16.8	26

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Appendix A.19. (Page 4 of 4).

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5	0	1	0	1	1.6	248		1	255		1
	6	0	1	0	1	1.6	234		1	255		1
	7	2	7	0	9	14.8	287	26.5	9	280	8.8	9
	8	2	1	0	3	4.9	347	57.1	3	290	17.7	3
21 May	9	5	5	0	10	16.4	348	48.2	10	297	11.7	10
	10	12	17	0	29	47.5	352	43.0	29	301	8.8	29
	11	6	2	0	8	13.1	361	22.1	8	303	5.7	8
	12											
	13											
	14											
	15											
Sample Total		27	34	0	61	100.0	339	48.5	61	296	14.0	61
	3											
	4	0	1	0	1	0.2	270		1	268		1
	5	5	5	0	10	2.4	263	53.0	10	263	19.4	10
	6	6	11	0	17	4.2	256	27.0	17	264	8.6	17
	7	32	49	0	81	19.8	301	35.8	81	276	9.3	81
	8	31	24	0	55	13.4	325	40.4	55	284	11.0	55
4–21 May	9	56	43	0	99	24.2	374	59.2	99	294	11.9	99
	10	58	60	0	118	28.9	397	56.7	118	301	9.9	118
	11	16	9	0	25	6.1	398	44.5	25	304	6.8	25
	12	1	2	0	3	0.7	506	62.4	3	317	8.3	3
	13											
	14											
	15											
All Samples Combined		205	204	0	409	100.0	354	68.4	409	290	16.0	409
Sex Composition		50.1	49.9									
Unaged		38	38	0	76	18.6	360	71.8	76	291	16.3	76
Sex Composition		50.0	50.0									

Appendix A.20. Age, sex, and size composition of Pacific herring caught by test variable-mesh gillnet, Kulukak Section, 1–25 May 1988.

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5											
	6											
	7	2	0	0	2	100.0	309	4.2	2	270	6.4	2
	8											
1 May	9											
	10											
	11											
	12											
	13											
	14											
	15											
Sample Total		2	0	0	2	100.0	309	4.2	2	270	6.4	2
	3											
	4											
	5	1	2	0	3	12.0	175	11.4	3	237	9.9	3
	6	1	0	0	1	4.0	196		1	250		1
	7	5	1	0	6	24.0	270	26.5	6	267	6.4	6
	8	2	1	0	3	12.0	338	34.9	3	285	7.6	3
4 May	9	2	3	0	5	20.0	382	44.0	5	295	6.5	5
	10	3	3	0	6	24.0	326	47.7	6	289	6.6	6
	11	1	0	0	1	4.0	418		1	305		1
	12											
	13											
	14											
	15											
Sample Total		15	10	0	25	100.0	306	77.3	25	277	20.9	25
	3											
	4											
	5	2	0	0	2	40.0	203	72.1	2	240	29.7	2
	6											
	7											
	8	1	0	0	1	20.0	306		1	282		1
5 May	9	1	1	0	2	40.0	331	86.3	2	291	8.5	2
	10											
	11											
	12											
	13											
	14											
	15											
Sample Total		4	1	0	5	100.0	275	87.0	5	269	30.7	5
	3											
	4											
	5											
	6	0	1	0	1	33.3	248		1	264		1
	7											
	8											
6 May	9											
	10											
	11	1	0	0	1	33.3	396		1	295		1
	12											
	13	1	0	0	1	33.3	398		1	303		1
	14											
	15											
Sample Total		2	1	0	3	100.0	347	86.0	3	287	20.6	3

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Appendix A.20. (Page 2 of 5).

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5											
	6											
	7											
	8	0	2	0	2	100.0	348	99.0	2	277	25.5	2
8 May	9											
	10											
	11											
	12											
	13											
	14											
	15											
Sample Total		0	2	0	2	100.0	348	99.0	2	277	25.5	2
	3											
	4											
	5	2	0	0	2	20.0	205	1.4	2	247	4.2	2
	6	1	0	0	1	10.0	212		1	252		1
	7	4	1	0	5	50.0	290	32.6	5	272	7.2	5
	8	0	1	0	1	10.0	386		1	292		1
9 May	9	0	1	0	1	10.0	324		1	278		1
	10											
	11											
	12											
	13											
	14											
	15											
Sample Total		7	3	0	10	100.0	278	61.3	10	268	15.3	10
	3											
	4	2	2	0	4	7.8	200	62.4	4	242	17.3	4
	5	12	5	0	17	33.3	201	34.8	17	249	9.6	17
	6	0	2	0	2	3.9	235	6.4	2	260	5.7	2
	7	4	6	0	10	19.6	274	51.8	10	270	11.3	10
	8	3	7	0	10	19.6	298	33.5	10	278	10.1	10
11 May	9	0	3	0	3	5.9	346	89.4	3	290	18.2	3
	10	2	2	0	4	7.8	345	57.3	4	296	7.4	4
	11	1	0	0	1	2.0	367		1	290		1
	12											
	13											
	14											
	15											
Sample Total		24	27	0	51	100.0	259	69.9	51	265	20.0	51
	3	1	0	0	1	2.2	98		1	220		1
	4	7	4	0	11	23.9	154	44.0	11	226	15.9	11
	5	5	11	0	16	34.8	189	26.8	16	244	10.3	16
	6	1	0	0	1	2.2	246		1	262		1
	7	0	8	0	8	17.4	284	48.2	8	273	10.1	8
	8	1	3	0	4	8.7	312	56.9	4	284	9.1	4
12 May	9	1	0	0	1	2.2	314		1	280		1
	10	2	1	0	3	6.5	398	46.9	3	302	8.7	3
	11	0	1	0	1	2.2	406		1	294		1
	12											
	13											
	14											
	15											
Sample Total		18	28	0	46	100.0	228	87.1	46	254	26.7	46

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Appendix A.20. (Page 3 of 5).

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5											
	6											
	7	1	0	0	1	25.0	318		1	282		1
	8											
13 May	9	2	1	0	3	75.0	417	54.0	3	307	7.6	3
	10											
	11											
	12											
	13											
	14	.										
	15											
Sample Total		3	1	0	4	100.0	393	66.4	4	301	13.8	4
	3											
	4	0	1	0	1	14.3	199		1	250		1
	5	0	1	0	1	14.3	220		1	250		1
	6	1	0	0	1	14.3	186		1	244		1
	7	0	2	0	2	28.6	315	15.6	2	278	5.7	2
	8	1	0	0	1	14.3	322		1	282		1
14 May	9											
	10	0	1	0	1	14.3	420		1	305		1
	11											
	12											
	13											
	14											
	15											
Sample Total		2	5	0	7	100.0	282	84.7	7	270	22.4	7
	3											
	4	0	1	0	1	1.6	202		1	250		1
	5	5	1	0	6	9.8	205	26.0	6	247	8.1	6
	6	0	2	0	2	3.3	261	12.7	2	268	3.5	2
	7	8	6	0	14	23.0	284	51.0	14	270	11.3	14
	8	1	2	0	3	4.9	288	31.4	3	280	8.9	3
15 May	9	6	5	0	11	18.0	395	63.4	11	298	7.4	11
	10	10	7	0	17	27.9	411	56.8	17	300	8.3	17
	11	3	2	0	5	8.2	413	41.4	5	305	6.8	5
	12	2	0	0	2	3.3	487	72.1	2	313	9.2	2
	13											
	14											
	15											
Sample Total		35	26	0	61	100.0	347	93.3	61	285	21.4	61
	3											
	4	1	0	0	1	1.3	134		1	218		1
	5	6	6	0	12	15.0	183	19.1	12	238	6.3	12
	6	2	0	0	2	2.5	229	58.0	2	255	14.8	2
	7	3	8	0	11	13.8	304	48.9	11	277	8.2	11
	8	7	4	0	11	13.8	332	31.3	11	288	6.9	11
18 May	9	7	10	0	17	21.3	392	69.3	17	297	11.0	17
	10	9	12	0	21	26.3	411	45.2	21	301	7.6	21
	11	2	2	0	4	5.0	430	45.8	4	309	4.1	4
	12	0	1	0	1	1.3	456		1	308		1
	13											
	14											
	15											
Sample Total		37	43	0	80	100.0	341	96.8	80	284	24.8	80

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Sample Dates	Age	Male	Female	Unknown	Total	Total	(g)	SD	Weighed	(mm)	SD	Measured
	3											
	4	2	1	0	3	2.3	125	25.2	3	217	13.3	3
	5	8	3	0	11	8.4	192	19.7	11	246	8.5	11
	6	3	0	0	3	2.3	221	21.9	3	260	5.1	3
	7	9	4	0	13	9.9	261	31.3	13	273	7.2	13
	8	7	2	0	9	6.9	305	56.1	9	287	13.7	9
19 May	9	15	11	0	26	19.8	358	63.5	26	297	10.5	26
	10	24	29	0	53	40.5	372	50.3	53	301	9.7	53
	11	4	8	0	12	9.2	416	47.7	12	312	6.1	12
	12	1	0	0	1	0.8	372		1	312		1
	13											
	14											
	15											
Sample Total		73	58	0	131	100.0	333	85.1	131	290	23.1	131
	3	1	0	0	1	0.5	118		1	216		1
	4	35	26	0	61	31.6	121	17.1	61	220	7.9	61
	5	34	30	0	64	33.2	159	22.6	64	236	8.9	64
	6	6	5	0	11	5.7	221	52.4	11	262	17.3	11
	7	9	7	0	16	8.3	257	36.1	16	270	8.0	16
	8	4	1	0	5	2.6	285	44.5	5	275	9.4	5
22 May	9	12	2	0	14	7.3	339	29.3	14	298	7.2	14
	10	11	5	0	16	8.3	366	35.4	16	303	5.9	16
	11	3	1	0	4	2.1	376	10.5	4	306	5.6	4
	12	0	1	0	1	0.5	480		1	305		1
	13											
	14											
	15											
Sample Total		115	78	0	193	100.0	198	92.4	193	248	31.2	193
	3	1	0	0	1	0.7	114		1	207		1
	4	9	11	0	20	14.2	131	14.8	20	217	7.5	20
	5	33	31	0	64	45.4	177	23.0	64	237	9.0	64
	6	1	2	0	3	2.1	224	13.1	3	257	2.6	3
	7	12	11	0	23	16.3	255	41.2	23	263	11.3	23
	8	7	3	0	10	7.1	314	47.2	10	283	14.1	10
23 May	9	6	6	0	12	8.5	344	48.1	12	290	8.0	12
	10	4	3	0	7	5.0	395	32.5	7	305	5.4	7
	11	1	0	0	1	0.7	404		1	304		1
	12											
	13											
	14											
	15											
Sample Total		74	67	0	141	100.0	220	83.0	141	250	27.3	141
	3											
	4	5	11	0	16	41.0	125	11.5	16	215	6.0	16
	5	6	9	0	15	38.5	168	25.4	15	236	10.8	15
	6	0	1	0	1	2.6	192		1	248		1
	7	0	1	0	1	2.6	244		1	254		1
	8	0	1	0	1	2.6	368		1	285		1
25 May	9	2	0	0	2	5.1	338	42.4	2	293	4.2	2
	10	1	2	0	3	7.7	405	54.3	3	306	8.7	3
	11											
	12											
	13											
	14											
	15											
Sample Total		14	25	0	39	100.0	185	90.4	39	237	29.8	39

– continued –

Appendix A.20. (Page 5 of 5).

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3	3	0	0	3	0.4	110	10.6	3	214	6.7	3
	4	61	57	0	118	14.8	130	28.9	118	220	11.0	118
	5	114	99	0	213	26.6	176	28.2	213	239	10.2	213
	6	16	13	0	29	3.6	224	37.8	29	259	12.1	29
	7	57	55	0	112	14.0	273	43.7	112	270	10.1	112
	8	34	27	0	61	7.6	314	45.2	61	283	11.1	61
1–25 May	9	54	43	0	97	12.1	365	60.4	97	296	9.9	97
	10	66	65	0	131	16.4	383	52.1	131	301	8.6	131
	11	16	14	0	30	3.8	409	40.4	30	307	7.7	30
	12	3	2	0	5	0.6	456	60.7	5	310	5.7	5
	13	1	0	0	1	0.1	398		1	303		1
	14											
	15											
All Samples Combined		425	375	0	800	100.0	262	106.7	800	265	31.9	800
Sex Composition		53.1	46.9									
Unaged		47	50	0	97	12.1	275	101.7	97	268	29.8	97
Sex Composition		48.5	51.5									

Appendix A.21. Age, sex, and size composition of Pacific herring caught by test variable-mesh gillnet, Nunavachak Section, 22–23 May 1988.

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4	5	5	0	10	9.7	141	24.9	10	230	10.4	10
	5	13	17	0	30	29.1	177	34.7	30	247	11.4	30
	6	2	5	0	7	6.8	208	28.0	7	259	8.9	7
	7	14	12	0	26	25.2	257	36.1	26	276	8.9	26
	8	4	3	0	7	6.8	313	46.3	7	291	12.6	7
22 May	9	6	3	0	9	8.7	332	59.3	9	296	12.6	9
	10	6	3	0	9	8.7	346	63.1	9	301	15.9	9
	11	3	2	0	5	4.9	382	40.9	5	309	14.0	5
	12											
	13											
	14											
	15											
Sample Total		53	50	0	103	100.0	244	83.1	103	268	26.5	103
	3											
	4	2	1	0	3	6.0	122	7.2	3	221	2.3	3
	5	5	8	0	13	26.0	169	28.2	13	245	10.5	13
	6	1	1	0	2	4.0	211	29.7	2	263	12.7	2
	7	11	5	0	16	32.0	247	43.7	16	273	10.8	16
	8	0	2	0	2	4.0	324	14.1	2	300	0.0	2
23 May	9	3	1	0	4	8.0	300	25.2	4	296	4.4	4
	10	4	2	0	6	12.0	309	22.6	6	296	7.3	6
	11	3	1	0	4	8.0	360	8.8	4	313	2.0	4
	12											
	13											
	14											
	15											
Sample Total		29	21	0	50	100.0	242	73.9	50	271	26.5	50
	3											
	4	7	6	0	13	8.5	137	23.3	13	228	9.8	13
	5	18	25	0	43	28.1	175	32.8	43	246	11.0	43
	6	3	6	0	9	5.9	208	26.5	9	260	9.2	9
	7	25	17	0	42	27.5	253	39.0	42	275	9.6	42
	8	4	5	0	9	5.9	316	40.7	9	293	11.7	9
22–23 May	9	9	4	0	13	8.5	322	52.5	13	296	10.5	13
	10	10	5	0	15	9.8	331	53.1	15	299	13.1	15
	11	6	3	0	9	5.9	372	31.7	9	311	10.2	9
	12											
	13											
	14											
	15											
All Samples Combined		82	71	0	153	100.0	243	80.0	153	269	26.4	153
Sex Composition		53.6	46.4									
Unaged		13	3	0	16	10.5	228	64.8	16	263	21.0	16
Sex Composition		81.3	18.8									

Appendix A.22. Age, sex, and size composition of Pacific herring caught by test variable-mesh gillnet, Hagemeister Section, 4–12 May 1988.

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5	0	1	0	1	9.1	190		1	234		1
	6	0	1	0	1	9.1	260		1	260		1
	7	1	0	0	1	9.1	236		1	252		1
	8	1	0	0	1	9.1	352		1	284		1
4 May	9	2	3	0	5	45.5	382	35.7	5	291	10.0	5
	10											
	11	2	0	0	2	18.2	463	54.4	2	309	10.6	2
	12											
	13											
	14											
	15											
Sample Total		6	5	0	11	100.0	352	92.3	11	282	24.5	11
	3											
	4											
	5											
	6											
	7											
	8											
5 May	9	1	0	0	1	100.0	340		1	279		1
	10											
	11											
	12											
	13											
	14											
	15											
Sample Total		1	0	0	1	100.0	340		1	279		1
	3											
	4											
	5											
	6											
	7											
	8	0	1	0	1	50.0	356		1	283		1
6 May	9											
	10											
	11	1	0	0	1	50.0	366		1	296		1
	12											
	13											
	14											
	15											
Sample Total		1	1	0	2	100.0	361	7.1	2	290	9.2	2
	3											
	4											
	5											
	6											
	7											
	8											
12 May	9											
	10											
	11											
	12	1	1	0	2	100.0	443	24.0	2	301	0.7	2
	13											
	14											
	15											
Sample Total		1	1	0	2	100.0	443	24.0	2	301	0.7	2

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Appendix A.22. (Page 2 of 2).

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5	0	1	0	1	6.3	190		1	234		1
	6	0	1	0	1	6.3	260		1	260		1
	7	1	0	0	1	6.3	236		1	252		1
	8	1	1	0	2	12.5	354	2.8	2	284	0.7	2
4–12 May	9	3	3	0	6	37.5	375	36.3	6	289	10.2	6
	10											
	11	3	0	0	3	18.8	430	67.7	3	304	10.4	3
	12	1	1	0	2	12.5	443	24.0	2	301	0.7	2
	13											
	14											
	15											
All Samples Combined		9	7	0	16	100.0	364	81.8	16	285	21.2	16
Sex Composition		56.3	43.8									
Unaged		0	0	0	0	0.0	0		0	0		0

Appendix A.23. Age, sex, and size composition of Pacific herring caught by test variable-mesh gillnet, Kulukak, Nunavachak, and Hagemeister Sections combined, 1–25 May 1988.

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5											
	6											
	7	2	0	0	2	100.0	309	4.2	2	270	6.4	2
	8											
1 May	9											
	10											
	11											
	12											
	13											
	14											
	15											
Sample Total		2	0	0	2	100.0	309	4.2	2	270	6.4	2
	3											
	4											
	5	1	3	0	4	11.1	179	11.8	4	237	8.2	4
	6	1	1	0	2	5.6	228	45.3	2	255	7.1	2
	7	6	1	0	7	19.4	265	27.4	7	265	8.1	7
	8	3	1	0	4	11.1	342	29.3	4	285	6.3	4
4 May	9	4	6	0	10	27.8	382	37.8	10	293	8.2	10
	10	3	3	0	6	16.7	326	47.7	6	289	6.6	6
	11	3	0	0	3	8.3	448	46.3	3	307	7.8	3
	12											
	13											
	14											
	15											
Sample Total		21	15	0	36	100.0	320	83.7	36	279	21.8	36
	3											
	4											
	5	2	0	0	2	33.3	203	72.1	2	240	29.7	2
	6											
	7											
	8	1	0	0	1	16.7	306		1	282		1
5 May	9	2	1	0	3	50.0	334	61.2	3	287	9.2	3
	10											
	11											
	12											
	13											
	14											
	15											
Sample Total		5	1	0	6	100.0	286	82.2	6	271	27.8	6
	3											
	4											
	5											
	6	0	1	0	1	20.0	248		1	264		1
	7											
	8	0	1	0	1	20.0	356		1	283		1
6 May	9											
	10											
	11	2	0	0	2	40.0	381	21.2	2	296	0.7	2
	12											
	13	1	0	0	1	20.0	398		1	303		1
	14											
	15											
Sample Total		3	2	0	5	100.0	353	61.4	5	288	15.3	5

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Appendix A.23. (Page 2 of 5).

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5											
	6											
	7											
	8	0	2	0	2	100.0	348	99.0	2	277	25.5	2
8 May	9											
	10											
	11											
	12											
	13											
	14											
	15											
Sample Total		0	2	0	2	100.0	348	99.0	2	277	25.5	2
	3											
	4											
	5	2	0	0	2	20.0	205	1.4	2	247	4.2	2
	6	1	0	0	1	10.0	212		1	252		1
	7	4	1	0	5	50.0	290	32.6	5	272	7.2	5
	8	0	1	0	1	10.0	386		1	292		1
9 May	9	0	1	0	1	10.0	324		1	278		1
	10											
	11											
	12											
	13											
	14											
	15											
Sample Total		7	3	0	10	100.0	278	61.3	10	268	15.3	10
	3											
	4	2	2	0	4	7.8	200	62.4	4	242	17.3	4
	5	12	5	0	17	33.3	201	34.8	17	249	9.6	17
	6	0	2	0	2	3.9	235	6.4	2	260	5.7	2
	7	4	6	0	10	19.6	274	51.8	10	270	11.3	10
	8	3	7	0	10	19.6	298	33.5	10	278	10.1	10
11 May	9	0	3	0	3	5.9	346	89.4	3	290	18.2	3
	10	2	2	0	4	7.8	345	57.3	4	296	7.4	4
	11	1	0	0	1	2.0	367		1	290		1
	12											
	13											
	14											
	15											
Sample Total		24	27	0	51	100.0	259	69.9	51	265	20.0	51
	3	1	0	0	1	2.1	98		1	220		1
	4	7	4	0	11	22.9	154	44.0	11	226	15.9	11
	5	5	11	0	16	33.3	189	26.8	16	244	10.3	16
	6	1	0	0	1	2.1	246		1	262		1
	7	0	8	0	8	16.7	284	48.2	8	273	10.1	8
	8	1	3	0	4	8.3	312	56.9	4	284	9.1	4
12 May	9	1	0	0	1	2.1	314		1	280		1
	10	2	1	0	3	6.3	398	46.9	3	302	8.7	3
	11	0	1	0	1	2.1	406		1	294		1
	12	1	1	0	2	4.2	443	24.0	2	301	0.7	2
	13											
	14											
	15											
Sample Total		19	29	0	48	100.0	237	95.7	48	256	27.8	48

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Appendix A.23. (Page 3 of 5).

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4											
	5											
	6											
	7	1	0	0	1	25.0	318		1	282		1
	8											
13 May	9	2	1	0	3	75.0	417	54.0	3	307	7.6	3
	10											
	11											
	12											
	13											
	14											
	15											
Sample Total		3	1	0	4	100.0	393	66.4	4	301	13.8	4
	3											
	4	0	1	0	1	14.3	199		1	250		1
	5	0	1	0	1	14.3	220		1	250		1
	6	1	0	0	1	14.3	186		1	244		1
	7	0	2	0	2	28.6	315	15.6	2	278	5.7	2
	8	1	0	0	1	14.3	322		1	282		1
14 May	9											
	10	0	1	0	1	14.3	420		1	305		1
	11											
	12											
	13											
	14											
	15											
Sample Total		2	5	0	7	100.0	282	84.7	7	270	22.4	7
	3											
	4	0	1	0	1	1.6	202		1	250		1
	5	5	1	0	6	9.8	205	26.0	6	247	8.1	6
	6	0	2	0	2	3.3	261	12.7	2	268	3.5	2
	7	8	6	0	14	23.0	284	51.0	14	270	11.3	14
	8	1	2	0	3	4.9	288	31.4	3	280	8.9	3
15 May	9	6	5	0	11	18.0	395	63.4	11	298	7.4	11
	10	10	7	0	17	27.9	411	56.8	17	300	8.3	17
	11	3	2	0	5	8.2	413	41.4	5	305	6.8	5
	12	2	0	0	2	3.3	487	72.1	2	313	9.2	2
	13											
	14											
	15											
Sample Total		35	26	0	61	100.0	347	93.3	61	285	21.4	61
	3											
	4	1	0	0	1	1.3	134		1	218		1
	5	6	6	0	12	15.0	183	19.1	12	238	6.3	12
	6	2	0	0	2	2.5	229	58.0	2	255	14.8	2
	7	3	8	0	11	13.8	304	48.9	11	277	8.2	11
	8	7	4	0	11	13.8	332	31.3	11	288	6.9	11
18 May	9	7	10	0	17	21.3	392	69.3	17	297	11.0	17
	10	9	12	0	21	26.3	411	45.2	21	301	7.6	21
	11	2	2	0	4	5.0	430	45.8	4	309	4.1	4
	12	0	1	0	1	1.3	456		1	308		1
	13											
	14											
	15											
Sample Total		37	43	0	80	100.0	341	96.8	80	284	24.8	80

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Appendix A.23. (Page 4 of 5).

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4	2	1	0	3	2.3	125	25.2	3	217	13.3	3
	5	8	3	0	11	8.4	192	19.7	11	246	8.5	11
	6	3	0	0	3	2.3	221	21.9	3	260	5.1	3
	7	9	4	0	13	9.9	261	31.3	13	273	7.2	13
	8	7	2	0	9	6.9	305	56.1	9	287	13.7	9
19 May	9	15	11	0	26	19.8	358	63.5	26	297	10.5	26
	10	24	29	0	53	40.5	372	50.3	53	301	9.7	53
	11	4	8	0	12	9.2	416	47.7	12	312	6.1	12
	12	1	0	0	1	0.8	372		1	312		1
	13											
	14											
	15											
Sample Total		73	58	0	131	100.0	333	85.1	131	290	23.1	131
	3	1	0	0	1	0.3	118		1	216		1
	4	40	31	0	71	24.0	123	19.6	71	221	8.9	71
	5	47	47	0	94	31.8	165	28.3	94	239	11.1	94
	6	8	10	0	18	6.1	216	44.0	18	260	14.4	18
	7	23	19	0	42	14.2	257	35.6	42	274	9.0	42
	8	8	4	0	12	4.1	302	45.9	12	284	13.7	12
22 May	9	18	5	0	23	7.8	337	42.4	23	297	9.5	23
	10	17	8	0	25	8.4	359	47.0	25	302	10.3	25
	11	6	3	0	9	3.0	379	29.8	9	307	10.6	9
	12	0	1	0	1	0.3	480		1	305		1
	13											
	14											
	15											
Sample Total		168	128	0	296	100.0	214	91.8	296	255	31.2	296
	3	1	0	0	1	0.5	114		1	207		1
	4	11	12	0	23	12.0	130	14.3	23	217	7.2	23
	5	38	39	0	77	40.3	176	24.0	77	239	9.7	77
	6	2	3	0	5	2.6	219	18.9	5	259	7.4	5
	7	23	16	0	39	20.4	252	41.8	39	267	12.0	39
	8	7	5	0	12	6.3	315	43.1	12	286	14.4	12
23 May	9	9	7	0	16	8.4	333	47.1	16	291	7.5	16
	10	8	5	0	13	6.8	356	52.5	13	300	7.6	13
	11	4	1	0	5	2.6	369	21.1	5	311	4.4	5
	12											
	13											
	14											
	15											
Sample Total		103	88	0	191	100.0	226	81.1	191	256	28.6	191
	3											
	4	5	11	0	16	41.0	125	11.5	16	215	6.0	16
	5	6	9	0	15	38.5	168	25.4	15	236	10.8	15
	6	0	1	0	1	2.6	192		1	248		1
	7	0	1	0	1	2.6	244		1	254		1
	8	0	1	0	1	2.6	368		1	285		1
25 May	9	2	0	0	2	5.1	338	42.4	2	293	4.2	2
	10	1	2	0	3	7.7	405	54.3	3	306	8.7	3
	11											
	12											
	13											
	14											
	15											
Sample Total		14	25	0	39	100.0	185	90.4	39	237	29.8	39

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Appendix A.23. (Page 5 of 5).

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3	3	0	0	3	0.3	110	10.6	3	214	6.7	3
	4	68	63	0	131	13.5	131	28.4	131	221	11.0	131
	5	132	125	0	257	26.5	176	28.9	257	240	10.6	257
	6	19	20	0	39	4.0	221	35.8	39	259	11.2	39
	7	83	72	0	155	16.0	267	43.2	155	271	10.3	155
	8	39	33	0	72	7.4	315	44.2	72	284	11.4	72
1–25 May	9	66	50	0	116	12.0	360	59.8	116	296	10.0	116
	10	76	70	0	146	15.1	377	54.3	146	301	9.1	146
	11	25	17	0	42	4.3	403	43.1	42	308	8.4	42
	12	4	3	0	7	0.7	453	51.0	7	307	6.6	7
	13	1	0	0	1	0.1	398		1	303		1
	14											
	15											
All Samples Combined		516	453	0	969	100.0	261	103.6	969	266	31.1	969
Sex Composition		53.3	46.7									
Unaged		60	53	0	113	11.7	268	98.5	113	267	28.7	113
Sex Composition		53.1	46.9									

Appendix A.24. Age, sex, and size composition of Pacific herring caught by dip net, Nunavachak Section, 23 May 1988.

Sample Dates	Age	Sex (number) Male	Female	Unknown	Total	Percent of Total	Weight Mean (g)	SD	Number Weighed	Length Mean (mm)	SD	Number Measured
	3											
	4	3	6	0	9	22.5	132	12.4	9	226	5.9	9
	5	7	8	0	15	37.5	168	19.7	15	245	5.1	15
	6	1	0	0	1	2.5	262		1	274		1
	7	1	4	0	5	12.5	262	10.1	5	275	6.7	5
	8	1	0	0	1	2.5	248		1	270		1
23 May	9	0	2	0	2	5.0	357	18.4	2	301	4.2	2
	10	1	3	0	4	10.0	310	21.3	4	295	8.4	4
	11	1	2	0	3	7.5	365	4.2	3	311	8.1	3
	12											
	13											
	14											
	15											
Sample Total		15	25	0	40	100.0	214	81.9	40	259	28.8	40
Sex Composition		37.5	62.5									
Unaged		3	2	0	5	12.5	200	105.6	5	251	31.9	5
Sex Composition		60.0	40.0									

Appendix B

Appendix B.1. Sexual maturity of Pacific herring caught by commercial purse seine, Togiak Section, 17 May 1988.

		Sex (number)				Gonad Maturity (%)					
						Male		Female			
Sample Dates	Age	Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4	4	2	0	6	100.0	0.0	0.0	0.0	100.0	0.0
	5	13	27	0	40	100.0	0.0	0.0	11.5	84.6	3.8
	6	3	8	0	11	100.0	0.0	0.0	0.0	85.7	14.3
	7	26	23	0	49	88.0	12.0	0.0	4.5	86.4	9.1
17 May	8	4	4	0	8	100.0	0.0	0.0	0.0	100.0	0.0
	9	13	4	0	17	38.5	61.5	0.0	25.0	50.0	25.0
	10	16	17	0	33	60.0	40.0	0.0	0.0	70.6	29.4
	11	8	3	0	11	50.0	50.0	0.0	0.0	66.7	33.3
	12	3	1	0	4	100.0	0.0	0.0	0.0	0.0	100.0
	13	1	0	0	1	100.0	0.0				
	14										
	15										
Sample Total		91	89	0	180	75.6	24.4	0.0	5.8	80.2	14.0

Appendix B.2. Sexual maturity of Pacific herring caught by commercial purse seine, Hagemeister Section, 17 May 1988.

		Sex (number)				Gonad Maturity (%)					
						Male		Female			
Sample Dates	Age	Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5	1	1	0	2	0.0	100.0	0.0	0.0	100.0	0.0
	6	1	0	0	1	100.0	0.0				
	7	13	11	0	24	100.0	0.0	0.0	0.0	81.8	18.2
17 May	8	2	8	0	10	100.0	0.0	0.0	0.0	100.0	0.0
	9	12	18	0	30	91.7	8.3	0.0	0.0	100.0	0.0
	10	33	48	0	81	97.0	3.0	0.0	0.0	97.9	2.1
	11	7	14	0	21	100.0	0.0	0.0	0.0	100.0	0.0
	12	0	3	0	3			0.0	0.0	100.0	0.0
	13										
	14										
	15										
Sample Total		69	103	0	172	95.7	4.3	0.0	0.0	97.1	2.9

Appendix B.3. Sexual maturity of Pacific herring caught by commercial purse seine, Pyrite Point Section, 17 May 1988.

		Sex (number)				Gonad Maturity (%)					
						Male		Female			
Sample Dates	Age	Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5										
	6										
	7	9	5	0	14	77.8	22.2	0.0	0.0	100.0	0.0
17 May	8	4	3	0	7	100.0	0.0	0.0	0.0	66.7	33.3
	9	18	13	0	31	94.4	5.6	0.0	0.0	100.0	0.0
	10	26	26	0	52	80.8	19.2	0.0	0.0	96.2	3.8
	11	17	11	0	28	94.1	5.9	0.0	0.0	100.0	0.0
	12	0	1	0	1	-		0.0	0.0	100.0	0.0
	13	0	1	0	1			0.0	0.0	100.0	0.0
	14										
	15										
Sample Total		74	60	0	134	87.8	12.2	0.0	0.0	96.7	3.3

Appendix B.4. Sexual maturity of Pacific herring caught by commercial purse seine, Cape Newenham Section, 17 May 1988.

		Sex (number)				Gonad Maturity (%)					
						Male		Female			
Sample Dates	Age	Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5	0	1	0	1			0.0	100.0	0.0	0.0
	6	1	0	0	1	100.0	0.0				
	7	5	8	0	13	100.0	0.0	0.0	0.0	100.0	0.0
17 May	8	8	5	0	13	100.0	0.0	0.0	0.0	100.0	0.0
	9	13	14	0	27	84.6	15.4	0.0	0.0	100.0	0.0
	10	30	27	0	57	96.7	3.3	0.0	0.0	96.3	3.7
	11	10	20	0	30	100.0	0.0	0.0	0.0	95.0	5.0
	12	3	2	0	5	66.7	33.3	0.0	0.0	100.0	0.0
	13										
	14	1	0	0	1	100.0	0.0				
	15										
Sample Total		71	77	0	148	94.4	5.6	0.0	1.3	96.1	2.6

Appendix B.5. Sexual maturity of Pacific herring caught by commercial purse seine, Togiak, Hagemeister, Pyrite Point, and Cape Newenham Sections combined, 17 May 1988.

		Sex (number)				Gonad Maturity (%)					
						Male		Female			
Sample Dates	Age	Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4	4	2	0	6	100.0	0.0	0.0	0.0	100.0	0.0
	5	14	29	0	43	91.7	8.3	0.0	14.3	82.1	3.6
	6	5	8	0	13	100.0	0.0	0.0	0.0	85.7	14.3
	7	53	47	0	100	90.4	9.6	0.0	2.2	89.1	8.7
17 May	8	18	20	0	38	100.0	0.0	0.0	0.0	95.0	5.0
	9	56	49	0	105	78.6	21.4	0.0	2.0	95.9	2.0
	10	105	118	0	223	87.5	2.5	0.0	0.0	93.2	6.8
	11	42	48	0	90	88.1	11.9	0.0	0.0	95.8	4.2
	12	6	7	0	13	83.3	6.7	0.0	0.0	85.7	14.3
	13	1	1	0	2	100.0	0.0	0.0	0.0	100.0	0.0
	14	1	0	0	1	100.0	0.0				
	15										
Sample Total		305	329	0	634	87.7	12.3	0.0	1.8	92.3	5.8

Appendix B.6. Sexual maturity of Pacific herring caught by commercial gillnet, Kulukak Section, 17 May 1988.

		Sex (number)				Gonad Maturity (%)					
						Male		Female			
Sample Dates	Age	Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5										
	6										
	7	10	7	0	17	90.0	10.0	0.0	0.0	100.0	0.0
17 May	8	8	4	0	12	100.0	0.0	0.0	25.0	75.0	0.0
	9	30	22	0	52	90.0	10.0	0.0	4.5	81.8	13.6
	10	43	40	0	83	95.3	4.7	0.0	0.0	92.5	7.5
	11	9	4	0	13	88.9	11.1	0.0	0.0	100.0	0.0
	12	3	0	0	3	66.7	33.3				
	13										
	14										
	15										
Sample Total		103	77	0	180	92.2	7.8	0.0	2.6	89.6	7.8

Appendix B.7. Sexual maturity of Pacific herring caught by commercial gillnet, Nunavachak Section, 17 May 1988.

		Sex (number)				Gonad Maturity (%)					
						Male		Female			
Sample Dates	Age	Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5										
	6										
	7	9	18	1	28	100.0	0.0	0.0	0.0	83.3	16.7
17 May	8	5	6	0	11	100.0	0.0	0.0	0.0	100.0	0.0
	9	18	20	0	38	94.4	5.6	0.0	0.0	90.0	10.0
	10	39	31	0	70	92.3	7.7	0.0	0.0	64.5	35.5
	11	9	13	0	22	88.9	11.1	0.0	0.0	61.5	38.5
	12	1	2	0	3	0.0	100.0	0.0	0.0	50.0	50.0
	13	1	0	0	1	100.0	0.0				
	14										
	15										
Sample Total		82	90	1	173	92.7	7.3	0.0	0.0	75.6	24.4

Appendix B.8. Sexual maturity of Pacific herring caught by commercial gillnet, Nunavachak and Kulukak Sections combined, 17 May 1988.

		Sex (number)				Gonad Maturity (%)					
						Male		Female			
Sample Dates	Age	Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5										
	6										
	7	19	25	1	45	94.7	5.3	0.0	0.0	88.0	12.0
17 May	8	13	10	0	23	100.0	0.0	0.0	10.0	90.0	0.0
	9	48	42	0	90	91.7	8.3	0.0	2.4	85.7	11.9
	10	82	71	0	153	93.9	6.1	0.0	0.0	80.3	19.7
	11	18	17	0	35	88.9	11.1	0.0	0.0	70.6	29.4
	12	4	2	0	6	50.0	50.0	0.0	0.0	50.0	50.0
	13	1	0	0	1	100.0	0.0				
	14										
	15										
Sample Total		185	167	1	353	92.4	7.6	0.0	1.2	82.0	16.8

Appendix B.9. Sexual maturity of Pacific herring caught by test commercial purse seine, Kulukak Section, 23 May 1988.

		Sex (number)				Gonad Maturity (%)					
						Male		Female			
Sample Dates	Age	Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4	12	10	0	22	83.3	16.7	0.0	0.0	100.0	0.0
	5	17	23	0	40	100.0	0.0	0.0	0.0	100.0	0.0
	6	2	4	0	6	100.0	0.0	0.0	0.0	75.0	25.0
	7	6	2	0	8	83.3	16.7	0.0	0.0	100.0	0.0
23 May	8	3	0	0	3	100.0	0.0				
	9	4	1	0	5	75.0	25.0	0.0	0.0	100.0	0.0
	10	10	0	0	10	80.0	20.0				
	11	1	1	0	2	100.0	0.0	0.0	0.0	100.0	0.0
	12										
	13										
	14										
	15										
Sample Total		55	41	0	96	89.1	10.9	0.0	0.0	97.6	2.4

Appendix B.10. Sexual maturity of Pacific herring caught by test commercial purse seine, Nunavachak Section, 13–24 May 1988.

		Sex (number)				Gonad Maturity (%)					
						Male		Female			
Sample Dates	Age	Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5										
	6	1	1	0	2	100.0	0.0	0.0	100.0	0.0	0.0
	7	1	4	0	5	100.0	0.0	0.0	100.0	0.0	0.0
13 May	8	4	2	0	6	100.0	0.0	0.0	100.0	0.0	0.0
	9	6	9	0	15	100.0	0.0	0.0	100.0	0.0	0.0
	10	22	12	0	34	100.0	0.0	0.0	100.0	0.0	0.0
	11	8	4	0	12	100.0	0.0	0.0	100.0	0.0	0.0
	12	0	2	0	2			0.0	100.0	0.0	0.0
	13	2	0	0	2	100.0	0.0				
	14	0	1	0	1			0.0	100.0	0.0	0.0
	15										
Sample Total		44	35	0	79	100.0	0.0	0.0	100.0	0.0	0.0
	1										
	2										
	3										
	4										
	5										
	6										
	7	2	4	0	6	100.0	0.0	0.0	50.0	50.0	0.0
16 May	8	0	3	0	3			0.0	0.0	100.0	0.0
	9	4	7	0	11	100.0	0.0	0.0	0.0	100.0	0.0
	10	17	18	0	35	100.0	0.0	0.0	0.0	100.0	0.0
	11	10	11	0	21	100.0	0.0	0.0	18.2	81.8	0.0
	12	1	2	0	3	100.0	0.0	0.0	50.0	50.0	0.0
	13	5	1	0	6	100.0	0.0	0.0	0.0	100.0	0.0
	14										
	15										
Sample Total		39	46	0	85	100.0	0.0	0.0	10.9	89.1	0.0
	1										
	2										
	3										
	4	1	0	0	1	100.0	0.0				
	5	4	7	0	11	50.0	50.0	0.0	14.3	85.7	0.0
	6	1	0	0	1	100.0	0.0				
	7	11	8	0	19	81.8	18.2	0.0	0.0	100.0	0.0
20 May	8	2	2	0	4	50.0	50.0	0.0	0.0	100.0	0.0
	9	11	8	0	19	81.8	18.2	0.0	0.0	100.0	0.0
	10	15	9	0	24	93.3	6.7	0.0	0.0	100.0	0.0
	11	6	5	0	11	100.0	0.0	0.0	0.0	100.0	0.0
	12	0	1	0	1			0.0	0.0	100.0	0.0
	13										
	14										
	15										
Sample Total		51	40	0	91	84.3	15.7	0.0	2.5	97.5	0.0

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Appendix B.10. (Page 2 of 2).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4	5	8	0	13	100.0	0.0	0.0	0.0	100.0	0.0
	5	22	21	0	43	90.9	9.1	0.0	0.0	100.0	0.0
	6	4	1	0	5	100.0	0.0	0.0	0.0	100.0	0.0
	7	11	10	0	21	90.9	9.1	0.0	0.0	100.0	0.0
24 May	8	2	3	0	5	100.0	0.0	0.0	0.0	100.0	0.0
	9	5	4	0	9	100.0	0.0	0.0	0.0	75.0	25.0
	10	4	2	0	6	100.0	0.0	0.0	0.0	100.0	0.0
	11	6	0	0	6	83.3	16.7				
	12										
	13										
	14										
	15										
Sample Total		59	49	0	108	93.2	6.8	0.0	0.0	98.0	2.0
	1										
	2										
	3										
	4	6	8	0	14	100.0	0.0	0.0	0.0	100.0	0.0
	5	26	28	0	54	84.6	15.4	0.0	3.6	96.4	0.0
	6	6	2	0	8	100.0	0.0	0.0	50.0	50.0	0.0
	7	25	26	0	51	88.0	12.0	0.0	23.1	76.9	0.0
13–24 May	8	8	10	0	18	87.5	12.5	0.0	20.0	80.0	0.0
	9	26	28	0	54	92.3	7.7	0.0	32.1	64.3	3.6
	10	58	41	0	99	98.3	1.7	0.0	29.3	70.7	0.0
	11	30	20	0	50	96.7	3.3	0.0	30.0	70.0	0.0
	12	1	5	0	6	100.0	0.0	0.0	60.0	40.0	0.0
	13	7	1	0	8	100.0	0.0	0.0	0.0	100.0	0.0
	14	0	1	0	1			0.0	100.0	0.0	0.0
	15										
All Samples		193	170	0	363	93.8	6.2	0.0	24.1	75.3	0.6

Appendix B.11. Sexual maturity of Pacific herring caught by test commercial purse seine, Togiak Section, 9–22 May 1988.

		Sex (number)				Gonad Maturity (%)					
						Male		Female			
Sample Dates	Age	Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5	4	2	0	6	100.0	0.0	0.0	0.0	100.0	0.0
	6										
	7	10	4	0	14	100.0	0.0	0.0	25.0	75.0	0.0
9 May	8	3	1	0	4	100.0	0.0	0.0	0.0	100.0	0.0
	9	5	6	0	11	100.0	0.0	0.0	0.0	100.0	0.0
	10	4	2	0	6	100.0	0.0	0.0	0.0	100.0	0.0
	11	0	1	0	1			0.0	0.0	100.0	0.0
	12										
	13										
	14										
	15										
Sample Total		26	16	0	42	100.0	0.0	0.0	6.3	93.8	0.0
	1										
	2										
	3										
	4										
	5	0	1	0	1			0.0	100.0	0.0	0.0
	6	1	1	0	2	100.0	0.0	0.0	100.0	0.0	0.0
	7	5	6	0	11	100.0	0.0	0.0	100.0	0.0	0.0
13 May	8	4	0	0	4	100.0	0.0				
	9	11	16	0	27	100.0	0.0	0.0	100.0	0.0	0.0
	10	11	19	0	30	100.0	0.0	0.0	100.0	0.0	0.0
	11	4	13	0	17	100.0	0.0	0.0	100.0	0.0	0.0
	12	0	2	0	2			0.0	100.0	0.0	0.0
	13	0	2	0	2			0.0	100.0	0.0	0.0
	14	0	2	0	2			0.0	100.0	0.0	0.0
	15										
Sample Total		36	62	0	98	100.0	0.0	0.0	100.0	0.0	0.0
	1										
	2										
	3										
	4										
	5										
	6	1	0	0	1	100.0	0.0				
	7	8	10	0	18	100.0	0.0	0.0	100.0	0.0	0.0
14 May	8	2	4	0	6	100.0	0.0	25.0	50.0	25.0	0.0
	9	12	15	0	27	100.0	0.0	6.7	93.3	0.0	0.0
	10	12	19	0	31	100.0	0.0	5.3	94.7	0.0	0.0
	11	7	13	0	20	100.0	0.0	0.0	100.0	0.0	0.0
	12	0	2	0	2			0.0	100.0	0.0	0.0
	13	0	1	0	1			0.0	100.0	0.0	0.0
	14										
	15										
Sample Total		42	64	0	106	100.0	0.0	4.7	93.8	1.6	0.0

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Appendix B.11. (Page 2 of 3).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
15 May	1										
	2										
	3										
	4										
	5	1	0	0	1	100.0	0.0				
	6										
	7	1	2	0	3	100.0	0.0	0.0	50.0	50.0	0.0
	8	0	1	0	1			0.0	100.0	0.0	0.0
	9	13	10	0	23	100.0	0.0	0.0	80.0	20.0	0.0
	10	19	24	0	43	100.0	0.0	0.0	58.3	41.7	0.0
	11	5	5	0	10	100.0	0.0	0.0	80.0	20.0	0.0
	12	2	0	0	2	100.0	0.0				
	13	1	1	0	2	100.0	0.0	0.0	100.0	0.0	0.0
	14										
	15										
Sample Total		42	43	0	85	100.0	0.0	0.0	67.4	32.6	0.0
16 May	1										
	2										
	3										
	4	0	1	0	1			0.0	100.0	0.0	0.0
	5	1	7	0	8	100.0	0.0	0.0	85.7	14.3	0.0
	6	2	1	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	7	16	15	0	31	100.0	0.0	0.0	26.7	73.3	0.0
	8	2	7	0	9	100.0	0.0	0.0	28.6	71.4	0.0
	9	5	9	0	14	100.0	0.0	0.0	0.0	100.0	0.0
	10	9	15	0	24	100.0	0.0	0.0	20.0	80.0	0.0
	11	5	11	0	16	100.0	0.0	0.0	18.2	81.8	0.0
	12	1	0	0	1	100.0	0.0				
	13										
	14										
	15										
Sample Total		41	66	0	107	100.0	0.0	0.0	27.3	72.7	0.0
19 May	1										
	2										
	3										
	4	0	1	0	1			0.0	0.0	100.0	0.0
	5	6	6	0	12	50.0	50.0	0.0	0.0	16.7	83.3
	6	3	1	0	4	0.0	0.0	0.0	0.0	100.0	0.0
	7	7	6	0	13	28.6	71.4	0.0	0.0	33.3	66.7
	8	3	3	0	6	0.0	100.0	0.0	0.0	33.3	66.7
	9	6	3	0	9	0.0	100.0	0.0	0.0	0.0	100.0
	10	13	13	0	26	7.7	92.3	0.0	0.0	0.0	100.0
	11	6	0	0	6	0.0	100.0				
	12	1	0	0	1	0.0	100.0				
	13	1	0	0	1	0.0	100.0				
	14										
	15										
Sample Total		46	33	0	79	13.0	87.0	0.0	0.0	18.2	81.8

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Appendix B.11. (Page 3 of 3).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4	11	17	0	28	27.3	72.7	0.0	58.8	0.0	41.2
	5	17	32	0	49	41.2	58.8	0.0	34.4	9.4	56.3
	6	6	1	0	7	50.0	50.0	0.0	0.0	100.0	0.0
	7	8	19	0	27	12.5	87.5	0.0	0.0	0.0	100.0
21 May	8	1	2	0	3	100.0	0.0	0.0	0.0	0.0	100.0
	9	14	6	0	20	0.0	100.0	0.0	16.7	0.0	83.3
	10	15	13	0	28	0.0	100.0	0.0	0.0	0.0	100.0
	11	10	22	0	32	0.0	100.0	0.0	0.0	0.0	100.0
	12	1	2	0	3	0.0	100.0	0.0	0.0	0.0	100.0
	13										
	14	0	1	0	1			0.0	0.0	0.0	100.0
	15										
Sample Total		83	115	0	198	18.1	81.9	0.0	19.1	3.5	77.4
	1										
	2										
	3										
	4	7	6	0	13	100.0	0.0	0.0	50.0	50.0	0.0
	5	7	3	0	10	71.4	28.6	0.0	33.3	66.7	0.0
	6	2	2	0	4	100.0	0.0	0.0	0.0	50.0	50.0
	7	11	9	0	20	0.0	100.0	0.0	0.0	0.0	100.0
22 May	8	1	1	0	2	0.0	100.0	0.0	0.0	0.0	100.0
	9	10	8	0	18	10.0	90.0	0.0	0.0	0.0	100.0
	10	17	12	0	29	17.6	82.4	0.0	0.0	0.0	100.0
	11	6	5	0	11	0.0	100.0	0.0	0.0	0.0	100.0
	12										
	13	1	0	0	1	0.0	100.0				
	14										
	15										
Sample Total		62	46	0	108	29.0	71.0	0.0	8.7	13.0	78.3
	1										
	2										
	3										
	4	18	25	0	43	55.6	44.4	0.0	56.0	16.0	28.0
	5	36	51	0	87	58.3	41.7	0.0	37.3	17.6	45.1
	6	15	6	0	21	60.0	40.0	0.0	16.7	66.7	16.7
	7	66	71	0	137	65.2	34.8	0.0	31.0	23.9	45.1
9–22 May	8	16	19	0	35	75.0	25.0	5.3	26.3	42.1	26.3
	9	76	73	0	149	61.8	38.2	1.4	53.4	23.3	21.9
	10	100	117	0	217	59.0	41.0	0.9	46.2	20.5	32.5
	11	43	70	0	113	48.8	51.2	0.0	45.7	15.7	38.6
	12	5	6	0	11	60.0	40.0	0.0	66.7	0.0	33.3
	13	3	4	0	7	33.3	66.7	0.0	100.0	0.0	0.0
	14	0	3	0	3			0.0	66.7	0.0	33.3
	15										
All Samples		378	445	0	823	59.8	40.2	0.7	44.0	21.1	34.2

Appendix B.12. Sexual maturity of Pacific herring caught by test commercial purse seine, Hagemeister Section, 12–23 May 1988.

		Sex (number)				Gonad Maturity (%)					
						Male		Female			
Sample Dates	Age	Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5										
	6	1	0	0	1	100.0	0.0				
	7	5	4	0	9	100.0	0.0	0.0	100.0	0.0	0.0
12 May	8	1	4	0	5	100.0	0.0	0.0	100.0	0.0	0.0
	9	7	5	0	12	100.0	0.0	0.0	100.0	0.0	0.0
	10	11	13	0	24	100.0	0.0	0.0	92.3	7.7	0.0
	11	6	7	0	13	100.0	0.0	0.0	100.0	0.0	0.0
	12	1	2	0	3	100.0	0.0	0.0	50.0	50.0	0.0
	13	2	1	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	14	0	1	0	1			0.0	100.0	0.0	0.0
	15										
Sample Total		34	37	0	71	100.0	0.0	0.0	91.9	8.1	0.0
	1										
	2										
	3										
	4										
	5	0	1	0	1			0.0	100.0	0.0	0.0
	6	0	2	0	2			0.0	100.0	0.0	0.0
	7	8	13	0	21	100.0	0.0	0.0	100.0	0.0	0.0
13 May	8	3	8	0	11	100.0	0.0	0.0	100.0	0.0	0.0
	9	14	18	0	32	100.0	0.0	0.0	100.0	0.0	0.0
	10	16	27	0	43	100.0	0.0	0.0	85.2	14.8	0.0
	11	11	17	0	28	100.0	0.0	0.0	88.2	11.8	0.0
	12	1	6	0	7	100.0	0.0	0.0	100.0	0.0	0.0
	13	0	1	0	1			0.0	100.0	0.0	0.0
	14	1	1	0	2	100.0	0.0	0.0	100.0	0.0	0.0
	15										
Sample Total		54	94	0	148	100.0	0.0	0.0	93.6	6.4	0.0
	1										
	2										
	3										
	4	1	0	0	1	100.0	0.0				
	5	3	2	0	5	100.0	0.0	0.0	50.0	50.0	0.0
	6	1	3	0	4	100.0	0.0	0.0	66.7	33.3	0.0
	7	9	7	0	16	100.0	0.0	0.0	71.4	28.6	0.0
14 May	8	4	3	0	7	100.0	0.0	0.0	100.0	0.0	0.0
	9	6	12	0	18	100.0	0.0	0.0	66.7	33.3	0.0
	10	12	7	0	19	100.0	0.0	0.0	85.7	14.3	0.0
	11	8	11	0	19	100.0	0.0	0.0	72.7	27.3	0.0
	12	3	0	1	4	100.0	0.0				
	13	1	0	0	1	100.0	0.0				
	14	0	1	0	1			0.0	0.0	100.0	0.0
	15										
Sample Total		48	46	1	95	100.0	0.0	0.0	71.7	28.3	0.0

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Appendix B.12. (Page 2 of 4).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5	0	1	0	1			0.0	100.0	0.0	0.0
	6	2	0	0	2	100.0	0.0				
	7	2	3	0	5	100.0	0.0	0.0	33.3	66.7	0.0
15 May	8	1	0	0	1	100.0	0.0				
	9	0	1	0	1			0.0	0.0	100.0	0.0
	10	5	6	0	11	100.0	0.0	0.0	50.0	50.0	0.0
	11	4	5	0	9	100.0	0.0	0.0	20.0	80.0	0.0
	12										
	13										
	14										
	15										
Sample Total		14	16	0	30	100.0	0.0	0.0	37.5	62.5	0.0
	1										
	2										
	3										
	4										
	5	0	1	0	1			0.0	0.0	100.0	0.0
	6	1	1	0	2	100.0	0.0	0.0	0.0	100.0	0.0
	7	10	15	0	25	100.0	0.0	0.0	13.3	86.7	0.0
16 May	8	2	9	0	11	100.0	0.0	0.0	22.2	66.7	11.1
	9	17	20	0	37	94.1	5.9	0.0	30.0	70.0	0.0
	10	14	33	0	47	100.0	0.0	0.0	9.1	78.8	12.1
	11	10	20	0	30	100.0	0.0	0.0	10.0	90.0	0.0
	12	1	1	0	2	100.0	0.0	0.0	0.0	100.0	0.0
	13	2	1	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	14										
	15										
Sample Total		57	101	0	158	98.2	1.8	0.0	14.9	80.2	5.0
	1										
	2										
	3										
	4	1	0	0	1	100.0	0.0				
	5	4	5	0	9	50.0	50.0	0.0	20.0	60.0	20.0
	6	0	2	0	2			0.0	0.0	100.0	0.0
	7	11	8	0	19	45.5	54.5	0.0	0.0	75.0	25.0
19 May	8	4	2	0	6	75.0	25.0	0.0	0.0	50.0	50.0
	9	9	5	0	14	55.6	44.4	0.0	0.0	80.0	20.0
	10	11	17	0	28	45.5	54.5	0.0	0.0	52.9	47.1
	11	11	9	0	20	54.5	45.5	0.0	0.0	33.3	66.7
	12	1	1	0	2	100.0	0.0	0.0	0.0	0.0	100.0
	13	0	1	0	1			0.0	0.0	0.0	100.0
	14										
	15										
Sample Total		52	50	0	102	53.8	46.2	0.0	2.0	56.0	42.0

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Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4	8	13	0	21	87.5	12.5	7.7	92.3	0.0	0.0
	5	20	10	0	30	100.0	0.0	0.0	90.0	10.0	0.0
	6	1	2	0	3	0.0	100.0	0.0	100.0	0.0	0.0
	7	3	1	0	4	100.0	0.0	0.0	0.0	0.0	100.0
20 May	8	2	0	0	2	100.0	0.0				
	9	1	1	0	2	0.0	100.0	0.0	0.0	0.0	100.0
	10	8	2	0	10	0.0	100.0	0.0	0.0	0.0	100.0
	11	3	4	0	7	0.0	100.0	0.0	0.0	0.0	100.0
	12										
	13	1	1	0	2	0.0	100.0	0.0	0.0	0.0	100.0
	14	0	1	0	1			0.0	0.0	0.0	100.0
	15										
Sample Total		47	35	0	82	68.1	31.9	2.9	65.7	2.9	28.6
	1										
	2										
	3										
	4	5	7	0	12	80.0	20.0	0.0	57.1	14.3	28.6
	5	12	2	0	14	66.7	33.3	0.0	50.0	50.0	0.0
	6	0	1	0	1			0.0	100.0	0.0	0.0
	7	12	9	0	21	75.0	25.0	0.0	0.0	44.4	55.6
21 May	8	0	2	0	2			0.0	0.0	50.0	50.0
	9	5	6	0	11	0.0	100.0	0.0	0.0	33.3	66.7
	10	11	3	0	14	18.2	81.8	0.0	0.0	33.3	66.7
	11	6	4	0	10	16.7	83.4	0.0	0.0	0.0	100.0
	12	2	0	0	2	50.0	50.0				
	13	0	2	0	2			0.0	0.0	0.0	100.0
	14	0	1	0	1			0.0	0.0	0.0	100.0
	15										
Sample Total		53	37	0	90	47.2	52.9	0.0	16.2	27.0	56.8
	1										
	2										
	3										
	4	5	2	0	7	80.0	20.0	50.0	0.0	50.0	0.0
	5	5	5	0	10	80.0	20.0	20.0	0.0	80.0	0.0
	6	1	3	0	4	100.0	0.0	0.0	0.0	100.0	0.0
	7	12	8	0	20	50.0	50.0	0.0	12.5	87.5	0.0
22 May	8	1	1	0	2	100.0	0.0	0.0	0.0	0.0	100.0
	9	12	2	0	14	41.7	58.3	0.0	0.0	50.0	50.0
	10	12	4	0	16	50.0	50.0	0.0	0.0	50.0	50.0
	11	6	6	0	12	16.7	83.3	0.0	0.0	50.0	50.0
	12	0	1	0	1			0.0	0.0	0.0	100.0
	13										
	14										
	15										
Sample Total		54	32	0	86	51.9	48.1	6.3	3.1	65.6	25.0

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Appendix B.12. (Page 4 of 4).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4	1	1	0	2	100.0	0.0	0.0	100.0	0.0	0.0
	5	6	6	0	12	16.7	83.3	0.0	0.0	0.0	100.0
	6										
	7	4	4	0	8	0.0	100.0	0.0	0.0	0.0	100.0
23 May	8	2	2	0	4	0.0	100.0	0.0	0.0	0.0	100.0
	9	0	4	0	4			0.0	0.0	0.0	100.0
	10	8	4	0	12	0.0	100.0	0.0	0.0	0.0	100.0
	11	1	4	0	5	0.0	100.0	0.0	0.0	0.0	100.0
	12	0	1	0	1			0.0	0.0	0.0	100.0
	13	0	1	0	1			0.0	0.0	0.0	100.0
	14										
	15										
Sample Total		22	27	0	49	9.1	90.9	0.0	3.7	0.0	96.3
	1										
	2										
	3										
	4	21	23	0	44	85.7	14.3	8.7	73.9	8.7	8.7
	5	50	33	0	83	76.0	24.0	3.0	42.4	33.3	21.2
	6	7	14	0	21	85.7	14.3	0.0	50.0	50.0	0.0
	7	76	72	0	148	75.0	25.0	0.0	36.1	47.2	16.7
12–23 May	8	20	31	0	51	85.0	15.0	0.0	54.8	25.8	19.4
	9	71	74	0	145	74.6	25.3	0.0	50.0	35.1	14.9
	10	108	116	0	224	65.7	34.3	0.0	40.5	40.5	19.0
	11	66	87	0	153	71.2	28.8	0.0	37.9	37.9	24.1
	12	9	12	1	22	88.9	11.1	0.0	58.3	16.7	25.0
	13	6	8	0	14	83.3	16.7	0.0	12.5	25.0	62.5
	14	1	5	0	6	100.0	0.0	0.0	40.0	20.0	40.0
	15										
All Samples		435	475	1	911	73.8	26.2	0.6	43.8	36.4	19.2

Appendix B.13. Sexual maturity of Pacific herring caught by test commercial purse seine, Pyrite Point Section, 19 May 1988.

		Sex (number)				Gonad Maturity (%)					
						Male		Female			
Sample Dates	Age	Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5	0	1	0	1			0.0	0.0	100.0	0.0
	6										
	7	9	7	0	16	88.9	11.1	0.0	0.0	100.0	0.0
19 May	8	5	2	0	7	100.0	0.0	0.0	0.0	100.0	0.0
	9	8	5	0	13	100.0	0.0	0.0	0.0	100.0	0.0
	10	16	17	0	33	93.8	6.3	0.0	0.0	94.1	5.9
	11	10	6	0	16	100.0	0.0	0.0	0.0	100.0	0.0
	12	1	2	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	13	0	1	0	1			0.0	0.0	100.0	0.0
	14										
	15										
Sample Total		49	41	0	90	95.9	4.1	0.0	0.0	97.6	2.4

Appendix B.14. Sexual maturity of Pacific herring caught by test commercial purse seine, Cape Newenham Section, 17 May 1988.

		Sex (number)				Gonad Maturity (%)					
						Male		Female			
Sample Dates	Age	Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5										
	6										
	7										
17 May	8	1	1	0	2	100.0	0.0	0.0	0.0	100.0	0.0
	9	2	2	0	4	100.0	0.0	0.0	0.0	100.0	0.0
	10	7	6	0	13	100.0	0.0	0.0	0.0	100.0	0.0
	11	2	4	0	6	100.0	0.0	0.0	0.0	100.0	0.0
	12	0	1	0	1			0.0	0.0	100.0	0.0
	13										
	14										
	15										
Sample Total		12	14	0	26	100.0	0.0	0.0	0.0	100.0	0.0

Appendix B.15. Sexual maturity of Pacific herring caught by test commercial purse seine, Kulukak, Nunavachak, Togiak, Hagemeister, Pyrite Point, and Cape Newenham Sections combined, 9–24 May 1988.

		Sex (number)				Gonad Maturity (%)					
						Male		Female			
Sample Dates	Age	Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5	4	2	0	6	100.0	0.0	0.0	0.0	100.0	0.0
	6										
	7	10	4	0	14	100.0	0.0	0.0	25.0	75.0	0.0
9 May	8	3	1	0	4	100.0	0.0	0.0	0.0	100.0	0.0
	9	5	6	0	11	100.0	0.0	0.0	0.0	100.0	0.0
	10	4	2	0	6	100.0	0.0	0.0	0.0	100.0	0.0
	11	0	1	0	1			0.0	0.0	100.0	0.0
	12										
	13										
	14										
	15										
Sample Total		26	16	0	42	100.0	0.0	0.0	6.3	93.8	0.0
	1										
	2										
	3										
	4										
	5										
	6	1	0	0	1	100.0	0.0				
	7	5	4	0	9	100.0	0.0	0.0	100.0	0.0	0.0
12 May	8	1	4	0	5	100.0	0.0	0.0	100.0	0.0	0.0
	9	7	5	0	12	100.0	0.0	0.0	100.0	0.0	0.0
	10	11	13	0	24	100.0	0.0	0.0	92.3	7.7	0.0
	11	6	7	0	13	100.0	0.0	0.0	100.0	0.0	0.0
	12	1	2	0	3	100.0	0.0	0.0	50.0	50.0	0.0
	13	2	1	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	14	0	1	0	1			0.0	100.0	0.0	0.0
	15										
Sample Total		34	37	0	71	100.0	0.0	0.0	91.9	8.1	0.0
	1										
	2										
	3										
	4										
	5	0	2	0	2			0.0	100.0	0.0	0.0
	6	2	4	0	6	100.0	0.0	0.0	100.0	0.0	0.0
	7	14	23	0	37	100.0	0.0	0.0	100.0	0.0	0.0
13 May	8	11	10	0	21	100.0	0.0	0.0	100.0	0.0	0.0
	9	31	43	0	74	100.0	0.0	0.0	100.0	0.0	0.0
	10	49	58	0	107	100.0	0.0	0.0	93.1	6.9	0.0
	11	23	34	0	57	100.0	0.0	0.0	94.1	5.9	0.0
	12	1	10	0	11	100.0	0.0	0.0	100.0	0.0	0.0
	13	2	3	0	5	100.0	0.0	0.0	100.0	0.0	0.0
	14	1	4	0	5	100.0	0.0	0.0	100.0	0.0	0.0
	15										
Sample Total		134	191	0	325	100.0	0.0	0.0	96.9	3.1	0.0

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Appendix B.15. (Page 2 of 5).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4	1	0	0	1	100.0	0.0				
	5	3	2	0	5	100.0	0.0	0.0	50.0	50.0	0.0
	6	2	3	0	5	100.0	0.0	0.0	66.7	33.3	0.0
	7	17	17	0	34	100.0	0.0	0.0	88.2	11.8	0.0
14 May	8	6	7	0	13	100.0	0.0	14.3	71.4	14.3	0.0
	9	18	27	0	45	100.0	0.0	3.7	81.5	14.8	0.0
	10	24	26	0	50	100.0	0.0	3.8	92.3	3.8	0.0
	11	15	24	0	39	100.0	0.0	0.0	87.5	12.5	0.0
	12	3	2	1	6	100.0	0.0	0.0	100.0	0.0	0.0
	13	1	1	0	2	100.0	0.0	0.0	100.0	0.0	0.0
	14	0	1	0	1			0.0	0.0	100.0	0.0
	15										
Sample Total		90	110	1	201	100.0	0.0	2.7	84.5	12.7	0.0
	1										
	2										
	3										
	4										
	5	1	1	0	2	100.0	0.0	0.0	100.0	0.0	0.0
	6	2	0	0	2	100.0	0.0				
	7	3	5	0	8	100.0	0.0	0.0	40.0	60.0	0.0
15 May	8	1	1	0	2	100.0	0.0	0.0	100.0	0.0	0.0
	9	13	11	0	24	100.0	0.0	0.0	72.7	27.3	0.0
	10	24	30	0	54	100.0	0.0	0.0	56.7	43.3	0.0
	11	9	10	0	19	100.0	0.0	0.0	50.0	50.0	0.0
	12	2	0	0	2	100.0	0.0				
	13	1	1	0	2	100.0	0.0	0.0	100.0	0.0	0.0
	14										
	15										
Sample Total		56	59	0	115	100.0	0.0	0.0	59.3	40.7	0.0
	1										
	2										
	3										
	4	0	1	0	1			0.0	100.0	0.0	0.0
	5	1	8	0	9	100.0	0.0	0.0	75.0	25.0	0.0
	6	3	2	0	5	100.0	0.0	0.0	0.0	100.0	0.0
	7	28	34	0	62	100.0	0.0	0.0	23.5	76.5	0.0
16 May	8	4	19	0	23	100.0	0.0	0.0	21.1	73.7	5.3
	9	26	36	0	62	96.2	3.8	0.0	16.7	83.3	0.0
	10	40	66	0	106	100.0	0.0	0.0	9.1	84.8	6.1
	11	25	42	0	67	100.0	0.0	0.0	14.3	85.7	0.0
	12	3	3	0	6	100.0	0.0	0.0	33.3	66.7	0.0
	13	7	2	0	9	100.0	0.0	0.0	0.0	100.0	0.0
	14										
	15										
Sample Total		137	213	0	350	99.3	0.7	0.0	17.8	79.8	2.3

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Appendix B.15. (Page 3 of 5).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5										
	6										
	7										
17 May	8	1	1	0	2	100.0	0.0	0.0	0.0	100.0	0.0
	9	2	2	0	4	100.0	0.0	0.0	0.0	100.0	0.0
	10	7	6	0	13	100.0	0.0	0.0	0.0	100.0	0.0
	11	2	4	0	6	100.0	0.0	0.0	0.0	100.0	0.0
	12	0	1	0	1			0.0	0.0	100.0	0.0
	13										
	14										
	15										
Sample Total		12	14	0	26	100.0	0.0	0.0	0.0	100.0	0.0
	1										
	2										
	3										
	4	1	1	0	2	100.0	0.0	0.0	0.0	100.0	0.0
	5	10	12	0	22	50.0	50.0	0.0	8.3	41.7	50.0
	6	3	3	0	6	0.0	100.0	0.0	0.0	100.0	0.0
	7	27	21	0	48	55.6	44.4	0.0	0.0	71.4	28.6
19 May	8	12	7	0	19	66.7	33.3	0.0	0.0	57.1	42.9
	9	23	13	0	36	56.5	43.5	0.0	0.0	69.2	30.8
	10	40	47	0	87	52.5	47.5	0.0	0.0	53.2	46.8
	11	27	15	0	42	59.3	40.7	0.0	0.0	60.0	40.0
	12	3	3	0	6	66.7	33.3	0.0	0.0	66.7	33.3
	13	1	2	0	3	0.0	100.0	0.0	0.0	50.0	50.0
	14										
	15										
Sample Total		147	124	0	271	55.1	44.9	0.0	0.8	59.7	39.5
	1										
	2										
	3										
	4	9	13	0	22	88.9	11.1	7.7	9.2	0.0	0.0
	5	24	17	0	41	91.7	8.3	0.0	58.8	41.2	0.0
	6	2	2	0	4	50.0	50.0	0.0	100.0	0.0	0.0
	7	14	9	0	23	85.7	14.3	0.0	0.0	88.9	11.1
20 May	8	4	2	0	6	75.0	25.0	0.0	0.0	100.0	0.0
	9	12	9	0	21	75.0	25.0	0.0	0.0	88.9	11.1
	10	23	11	0	34	60.9	39.1	0.0	0.0	81.8	18.2
	11	9	9	0	18	66.7	33.3	0.0	0.0	55.6	44.4
	12	0	1	0	1			0.0	0.0	100.0	0.0
	13	1	1	0	2	0.0	100.0	0.0	0.0	0.0	100.0
	14	0	1	0	1			0.0	0.0	0.0	100.0
	15										
Sample Total		98	75	0	173	76.5	23.5	1.3	32.0	53.3	13.3

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Appendix B.15. (Page 4 of 5).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4	16	24	0	40	43.8	56.3	0.0	58.3	4.2	37.5
	5	29	34	0	63	51.7	48.3	0.0	35.3	11.8	52.9
	6	6	2	0	8	50.0	50.0	0.0	50.0	50.0	0.0
	7	20	28	0	48	50.0	50.0	0.0	0.0	14.3	85.7
21 May	8	1	4	0	5	100.0	0.0	0.0	0.0	25.0	75.0
	9	19	12	0	31	0.0	100.0	0.0	8.3	16.7	75.0
	10	26	16	0	42	7.7	92.3	0.0	0.0	6.3	93.8
	11	16	26	0	42	6.3	93.8	0.0	0.0	0.0	100.0
	12	3	2	0	5	33.3	66.7	0.0	0.0	0.0	100.0
	13	0	2	0	2			0.0	0.0	0.0	100.0
	14	0	2	0	2			0.0	0.0	0.0	100.0
	15										
Sample Total		136	152	0	288	29.4	70.6	0.0	18.4	9.2	72.4
	1										
	2										
	3										
	4	12	8	0	20	91.7	8.3	12.5	37.5	50.0	0.0
	5	12	8	0	20	75.0	25.0	12.5	12.5	75.0	0.0
	6	3	5	0	8	100.0	0.0	0.0	0.0	80.0	20.0
	7	23	17	0	40	26.1	73.9	0.0	5.9	41.2	52.9
22 May	8	2	2	0	4	50.0	50.0	0.0	0.0	0.0	100.0
	9	22	10	0	32	27.3	72.7	0.0	0.0	10.0	90.0
	10	29	16	0	45	31.0	69.0	0.0	0.0	12.5	87.5
	11	12	11	0	23	8.3	91.7	0.0	0.0	27.3	72.7
	12	0	1	0	1			0.0	0.0	0.0	100.0
	13	1	0	0	1	0.0	100.0				
	14										
	15										
Sample Total		116	78	0	194	39.7	60.3	2.6	6.4	34.6	56.4
	1										
	2										
	3										
	4	13	11	0	24	84.6	15.4	0.0	9.1	90.9	0.0
	5	23	29	0	52	78.3	21.7	0.0	0.0	79.3	20.7
	6	2	4	0	6	100.0	0.0	0.0	0.0	75.0	25.0
	7	10	6	0	16	50.0	50.0	0.0	0.0	33.3	66.7
23 May	8	5	2	0	7	60.0	40.0	0.0	0.0	0.0	100.0
	9	4	5	0	9	75.0	25.0	0.0	0.0	20.0	80.0
	10	18	4	0	22	44.4	55.6	0.0	0.0	0.0	100.0
	11	2	5	0	7	50.0	50.0	0.0	0.0	20.0	80.0
	12	0	1	0	1			0.0	0.0	0.0	100.0
	13	0	1	0	1			0.0	0.0	0.0	100.0
	14										
	15										
Sample Total		77	68	0	145	66.2	33.8	0.0	1.5	58.8	39.7

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Appendix B.15. (Page 5 of 5).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4	5	8	0	13	100.0	0.0	0.0	0.0	100.0	0.0
	5	22	21	0	43	90.9	9.1	0.0	0.0	100.0	0.0
	6	4	1	0	5	100.0	0.0	0.0	0.0	100.0	0.0
	7	11	10	0	21	90.9	9.1	0.0	0.0	100.0	0.0
24 May	8	2	3	0	5	100.0	0.0	0.0	0.0	100.0	0.0
	9	5	4	0	9	100.0	0.0	0.0	0.0	75.0	25.0
	10	4	2	0	6	100.0	0.0	0.0	0.0	100.0	0.0
	11	6	0	0	6	83.3	16.7				
	12										
	13										
	14										
	15										
Sample Total		59	49	0	108	93.2	6.8	0.0	0.0	98.0	2.0
	1										
	2										
	3										
	4	57	66	0	123	77.2	22.8	3.0	47.0	36.4	13.6
	5	129	136	0	265	76.0	24.1	0.7	25.0	52.2	22.1
	6	30	26	0	56	76.7	23.3	0.0	34.6	57.7	7.7
	7	182	178	0	360	74.2	25.8	0.0	30.3	44.9	24.7
9–24 May	8	53	63	0	116	84.9	15.1	1.6	38.1	42.9	17.5
	9	187	183	0	370	73.3	26.7	0.5	46.4	37.7	15.3
	10	299	297	0	596	72.6	27.4	0.3	38.0	41.1	20.5
	11	152	188	0	340	72.4	27.9	0.0	37.8	36.7	25.5
	12	16	26	1	43	81.3	18.8	0.0	53.8	26.9	19.2
	13	16	14	0	30	81.3	18.8	0.0	35.7	28.6	35.7
	14	1	9	0	10	100.0	0.0	0.0	55.6	11.1	33.3
	15										
All Samples		1,122	1,186	1	2,309	74.5	25.5	0.5	37.5	41.2	20.7

Appendix B.16. Sexual maturity of Pacific herring caught by test commercial gillnet, Kulukak Section, 4–21 May 1988.

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5										
	6										
	7										
4 May	8	1	0	0	1	100.0	0.0				
	9	1	0	0	1	100.0	0.0				
	10	0	3	0	3			0.0	0.0	100.0	0.0
	11										
	12										
	13										
	14										
	15										
Sample Total		2	3	0	5	100.0	0.0	0.0	0.0	100.0	0.0
	1										
	2										
	3										
	4										
	5	1	0	0	1	100.0	0.0				
	6										
	7	2	2	0	4	100.0	0.0	0.0	100.0	0.0	0.0
5 May	8	1	1	0	2	100.0	0.0	0.0	0.0	100.0	0.0
	9	2	2	0	4	100.0	0.0	0.0	0.0	100.0	0.0
	10	0	1	0	1			0.0	0.0	100.0	0.0
	11										
	12										
	13										
	14										
	15										
Sample Total		6	6	0	12	100.0	0.0	0.0	33.3	66.7	0.0
	1										
	2										
	3										
	4										
	5	0	2	0	2			0.0	50.0	50.0	0.0
	6	1	3	0	4	100.0	0.0	0.0	33.3	66.7	0.0
	7	7	3	0	10	100.0	0.0	0.0	33.3	66.7	0.0
7 May	8	1	2	0	3	100.0	0.0	0.0	50.0	50.0	0.0
	9	4	1	0	5	100.0	0.0	0.0	0.0	100.0	0.0
	10	2	2	0	4	100.0	0.0	0.0	0.0	100.0	0.0
	11										
	12										
	13										
	14										
	15										
Sample Total		15	13	0	28	100.0	0.0	0.0	30.8	69.2	0.0

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Appendix B.16. (Page 2 of 4).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5										
	6	1	0	0	1	100.0	0.0				
	7	0	1	0	1			0.0	0.0	100.0	0.0
9 May	8	1	1	0	2	100.0	0.0	0.0	100.0	0.0	0.0
	9	2	1	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	10	2	1	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	11										
	12										
	13										
	14										
	15										
Sample Total		6	4	0	10	100.0	0.0	0.0	25.0	75.0	0.0
	1										
	2										
	3										
	4										
	5										
	6	0	1	0	1			0.0	100.0	0.0	0.0
	7	3	2	0	5	100.0	0.0	0.0	0.0	100.0	0.0
11 May	8	2	2	0	4	100.0	0.0	0.0	0.0	100.0	0.0
	9	3	0	0	3	100.0	0.0				
	10	3	0	0	3	100.0	0.0				
	11										
	12										
	13										
	14										
	15										
Sample Total		11	5	0	16	100.0	0.0	0.0	20.0	80.0	0.0
	1										
	2										
	3										
	4										
	5	1	2	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	6	2	4	0	6	100.0	0.0	0.0	25.0	75.0	0.0
	7	7	7	0	14	100.0	0.0	0.0	14.3	85.7	0.0
12 May	8	10	7	0	17	100.0	0.0	0.0	0.0	100.0	0.0
	9	4	5	0	9	100.0	0.0	0.0	0.0	100.0	0.0
	10	2	4	0	6	100.0	0.0	0.0	0.0	100.0	0.0
	11										
	12										
	13										
	14										
	15										
Sample Total		26	29	0	55	100.0	0.0	0.0	6.9	93.1	0.0

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Appendix B.16. (Page 3 of 4).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4	0	1	0	1			0.0	0.0	100.0	0.0
	5	1	0	0	1	100.0	0.0				
	6	1	1	0	2	100.0	0.0	0.0	0.0	100.0	0.0
	7	4	11	0	15	100.0	0.0	0.0	18.2	81.8	0.0
13 May	8	7	3	0	10	100.0	0.0	0.0	66.7	33.3	0.0
	9	11	9	0	20	100.0	0.0	0.0	55.6	44.4	0.0
	10	10	12	0	22	100.0	0.0	0.0	66.7	33.3	0.0
	11	1	0	0	1	100.0	0.0				
	12										
	13										
	14										
	15										
Sample Total		35	37	0	72	100.0	0.0	0.0	45.9	54.1	0.0
	1										
	2										
	3										
	4										
	5										
	6	1	0	0	1	100.0	0.0				
	7										
14 May	8	1	3	0	4	100.0	0.0	0.0	33.3	66.7	0.0
	9	2	4	0	6	100.0	0.0	0.0	0.0	100.0	0.0
	10	4	4	0	8	100.0	0.0	0.0	0.0	100.0	0.0
	11	1	2	0	3	100.0	0.0	0.0	50.0	50.0	0.0
	12	1	2	0	3	100.0	0.0	0.0	50.0	50.0	0.0
	13										
	14										
	15										
Sample Total		10	15	0	25	100.0	0.0	0.0	20.0	80.0	0.0
	1										
	2										
	3										
	4										
	5										
	6	1	0	0	1	100.0	0.0				
	7	2	5	0	7	100.0	0.0	0.0	80.0	20.0	0.0
15 May	8	2	0	0	2	100.0	0.0				
	9	5	6	0	11	100.0	0.0	0.0	33.3	66.7	0.0
	10	8	8	0	16	100.0	0.0	0.0	62.5	37.5	0.0
	11	3	2	0	5	100.0	0.0	0.0	50.0	50.0	0.0
	12										
	13										
	14										
	15										
Sample Total		21	21	0	42	100.0	0.0	0.0	57.1	42.9	0.0

– continued –

Appendix B.16. (Page 4 of 4).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5	1	0	0	1	100.0	0.0				
	6										
	7	1	4	0	5	100.0	0.0	0.0	0.0	100.0	0.0
16 May	8	0	1	0	1			0.0	0.0	100.0	0.0
	9	5	2	0	7	100.0	0.0	0.0	0.0	100.0	0.0
	10	5	5	0	10	100.0	0.0	0.0	0.0	100.0	0.0
	11	2	0	0	2	100.0	0.0				
	12										
	13										
	14										
	15										
Sample Total		14	12	0	26	100.0	0.0	0.0	0.0	100.0	0.0
	1										
	2										
	3										
	4										
	5	0	1	0	1			0.0	0.0	100.0	0.0
	6	0	1	0	1			0.0	0.0	100.0	0.0
	7	2	7	0	9	100.0	0.0	0.0	0.0	85.7	14.3
21 May	8	2	1	0	3	50.0	50.0	0.0	0.0	100.0	0.0
	9	5	5	0	10	80.0	20.0	0.0	0.0	100.0	0.0
	10	12	17	0	29	41.7	58.3	0.0	0.0	52.9	47.1
	11	6	2	0	8	33.3	66.7	0.0	0.0	50.0	50.0
	12										
	13										
	14										
	15										
Sample Total		27	34	0	61	51.9	48.1	0.0	0.0	70.6	29.4
	1										
	2										
	3										
	4	0	1	0	1			0.0	0.0	100.0	0.0
	5	5	5	0	10	100.0	0.0	0.0	20.0	80.0	0.0
	6	6	10	0	16	100.0	0.0	0.0	30.0	70.0	0.0
	7	28	42	0	70	100.0	0.0	0.0	23.8	73.8	2.4
4–21 May	8	28	21	0	49	96.4	3.6	0.0	23.8	76.2	0.0
	9	44	35	0	79	97.7	2.3	0.0	20.0	80.0	0.0
	10	48	57	0	105	85.4	14.6	0.0	22.8	63.2	14.0
	11	13	6	0	19	69.2	30.8	0.0	33.3	50.0	16.7
	12	1	2	0	3	100.0	0.0	0.0	50.0	50.0	0.0
	13										
	14										
	15										
All Samples		173	179	0	352	92.4	7.6	0.0	23.5	70.9	5.6

Appendix B.17. Sexual maturity of Pacific herring caught by test commercial gillnet, Nunavachak Section, 6–15 May 1988.

		Sex (number)				Gonad Maturity (%)					
						Male		Female			
Sample Dates	Age	Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
6 May	1										
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9	1	2	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	10										
	11										
	12										
	13										
	14										
	15										
Sample Total		1	2	0	3	100.0	0.0	0.0	0.0	100.0	0.0
12 May	1										
	2										
	3										
	4										
	5										
	6	0	1	0	1			0.0	0.0	100.0	0.0
	7	3	3	0	6	100.0	0.0	0.0	0.0	100.0	0.0
	8	2	1	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	9	6	2	0	8	100.0	0.0	0.0	0.0	100.0	0.0
	10	6	0	0	6	100.0	0.0				
	11	1	1	0	2	100.0	0.0	0.0	0.0	100.0	0.0
	12										
	13										
	14										
	15										
Sample Total		18	8	0	26	100.0	0.0	0.0	0.0	100.0	0.0
15 May	1										
	2										
	3										
	4										
	5										
	6										
	7	0	3	0	3			0.0	33.3	66.7	0.0
	8	0	2	0	2			0.0	0.0	100.0	0.0
	9	1	3	0	4	100.0	0.0	0.0	33.3	66.7	0.0
	10	3	3	0	6	100.0	0.0	33.3	33.3	33.3	0.0
	11	2	2	0	4	100.0	0.0	0.0	0.0	100.0	0.0
	12										
	13										
	14										
	15										
Sample Total		6	13	0	19	100.0	0.0	8.3	25.0	66.7	0.0

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Appendix B.17. (Page 2 of 2).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5										
	6	0	1	0	1			0.0	0.0	100.0	0.0
	7	3	6	0	9	100.0	0.0	0.0	16.7	83.3	0.0
6–15 May	8	2	3	0	5	100.0	0.0	0.0	0.0	100.0	0.0
	9	8	7	0	15	100.0	0.0	0.0	14.3	85.7	0.0
	10	9	3	0	12	100.0	0.0	33.3	33.3	33.3	0.0
	11	3	3	0	6	100.0	0.0	0.0	0.0	100.0	0.0
	12										
	13										
	14										
	15										
All Samples		25	23	0	48	100.0	0.0	4.5	13.6	81.8	0.0

Appendix B.18. Sexual maturity of Pacific herring caught by test commercial gillnet, Togiak Section, 8–12 May 1988.

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5										
	6										
	7	1	1	0	2	100.0	0.0	0.0	100.0	0.0	0.0
8 May	8	1	0	0	1	100.0	0.0				
	9	4	0	0	4	100.0	0.0				
	10	1	0	0	1	100.0	0.0				
	11										
	12										
	13										
	14										
	15										
Sample Total		7	1	0	8	100.0	0.0	0.0	100.0	0.0	0.0
	1										
	2										
	3										
	4										
	5										
	6										
	7										
12 May	8										
	9	0	1	0	1			0.0	100.0	0.0	0.0
	10										
	11										
	12										
	13										
	14										
	15										
Sample Total		0	1	0	1			0.0	100.0	0.0	0.0
	1										
	2										
	3										
	4										
	5										
	6										
	7	1	1	0	2	100.0	0.0	0.0	100.0	0.0	0.0
8–12 May	8	1	0	0	1	100.0	0.0				
	9	4	1	0	5	100.0	0.0	0.0	100.0	0.0	0.0
	10	1	0	0	1	100.0	0.0				
	11										
	12										
	13										
	14										
	15										
All Samples		7	2	0	9	100.0	0.0	0.0	100.0	0.0	0.0

Appendix B.19. Sexual maturity of Pacific herring caught by test commercial gillnet, Kulukak, Nunavachak, and Togiak Sections combined, 4–21 May 1988.

		Sex (number)				Gonad Maturity (%)					
						Male		Female			
Sample Dates	Age	Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5										
	6										
	7										
4 May	8	1	0	0	1	100.0	0.0				
	9	1	0	0	1	100.0	0.0				
	10	0	3	0	3			0.0	0.0	100.0	0.0
	11										
	12										
	13										
	14										
	15										
Sample Total		2	3	0	5	100.0	0.0	0.0	0.0	100.0	0.0
	1										
	2										
	3										
	4										
	5	1	0	0	1	100.0	0.0				
	6										
	7	2	2	0	4	100.0	0.0	0.0	100.0	0.0	0.0
5 May	8	1	1	0	2	100.0	0.0	0.0	0.0	100.0	0.0
	9	2	2	0	4	100.0	0.0	0.0	0.0	100.0	0.0
	10	0	1	0	1			0.0	0.0	100.0	0.0
	11										
	12										
	13										
	14										
	15										
Sample Total		6	6	0	12	100.0	0.0	0.0	33.3	66.7	0.0
	1										
	2										
	3										
	4										
	5										
	6										
	7										
6 May	8										
	9	1	2	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	10										
	11										
	12										
	13										
	14										
	15										
Sample Total		1	2	0	3	100.0	0.0	0.0	0.0	100.0	0.0

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Appendix B.19. (Page 2 of 5).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5	0	2	0	2			0.0	50.0	50.0	0.0
	6	1	3	0	4	100.0	0.0	0.0	33.3	66.7	0.0
	7	7	3	0	10	100.0	0.0	0.0	33.3	66.7	0.0
7 May	8	1	2	0	3	100.0	0.0	0.0	50.0	50.0	0.0
	9	4	1	0	5	100.0	0.0	0.0	0.0	100.0	0.0
	10	2	2	0	4	100.0	0.0	0.0	0.0	100.0	0.0
	11										
	12										
	13										
	14										
	15										
Sample Total		15	13	0	28	100.0	0.0	0.0	30.8	69.2	0.0
	1										
	2										
	3										
	4										
	5										
	6										
	7	1	1	0	2	100.0	0.0	0.0	100.0	0.0	0.0
8 May	8	1	0	0	1	100.0	0.0				
	9	4	0	0	4	100.0	0.0				
	10	1	0	0	1	100.0	0.0				
	11										
	12										
	13										
	14										
	15										
Sample Total		7	1	0	8	100.0	0.0	0.0	100.0	0.0	0.0
	1										
	2										
	3										
	4										
	5	1	0	0	1	100.0	0.0				
	6										
	7	0	1	0	1			0.0	0.0	100.0	0.0
9 May	8	1	1	0	2	100.0	0.0	0.0	100.0	0.0	0.0
	9	2	1	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	10	2	1	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	11										
	12										
	13										
	14										
	15										
Sample Total		6	4	0	10	100.0	0.0	0.0	25.0	75.0	0.0

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Appendix B.19. (Page 3 of 5).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5										
	6	0	1	0	1			0.0	100.0	0.0	0.0
	7	3	2	0	5	100.0	0.0	0.0	0.0	100.0	0.0
11 May	8	2	2	0	4	100.0	0.0	0.0	0.0	100.0	0.0
	9	3	0	0	3	100.0	0.0				
	10	3	0	0	3	100.0	0.0				
	11										
	12										
	13										
	14										
	15										
Sample Total		11	5	0	16	100.0	0.0	0.0	20.0	80.0	0.0
	1										
	2										
	3										
	4										
	5	1	2	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	6	2	5	0	7	100.0	0.0	0.0	20.0	80.0	0.0
	7	10	10	0	20	100.0	0.0	0.0	10.0	90.0	0.0
12 May	8	12	8	0	20	100.0	0.0	0.0	0.0	100.0	0.0
	9	10	8	0	18	100.0	0.0	0.0	12.5	87.5	0.0
	10	8	4	0	12	100.0	0.0	0.0	0.0	100.0	0.0
	11	1	1	0	2	100.0	0.0	0.0	0.0	100.0	0.0
	12										
	13										
	14										
	15										
Sample Total		44	38	0	82	100.0	0.0	0.0	7.9	92.1	0.0
	1										
	2										
	3										
	4	0	1	0	1			0.0	0.0	100.0	0.0
	5	1	0	0	1	100.0	0.0				
	6	1	1	0	2	100.0	0.0	0.0	0.0	100.0	0.0
	7	4	11	0	15	100.0	0.0	0.0	18.2	81.8	0.0
13 May	8	7	3	0	10	100.0	0.0	0.0	66.7	33.3	0.0
	9	11	9	0	20	100.0	0.0	0.0	55.6	44.4	0.0
	10	10	12	0	22	100.0	0.0	0.0	66.7	33.3	0.0
	11	1	0	0	1	100.0	0.0				
	12										
	13										
	14										
	15										
Sample Total		35	37	0	72	100.0	0.0	0.0	45.9	54.1	0.0

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Appendix B.19. (Page 4 of 5).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5										
	6	1	0	0	1	100.0	0.0				
	7										
14 May	8	1	3	0	4	100.0	0.0	0.0	33.3	66.7	0.0
	9	2	4	0	6	100.0	0.0	0.0	0.0	100.0	0.0
	10	4	4	0	8	100.0	0.0	0.0	0.0	100.0	0.0
	11	1	2	0	3	100.0	0.0	0.0	50.0	50.0	0.0
	12	1	2	0	3	100.0	0.0	0.0	50.0	50.0	0.0
	13										
	14										
	15										
Sample Total		10	15	0	25	100.0	0.0	0.0	20.0	80.0	0.0
	1										
	2										
	3										
	4										
	5										
	6	1	0	0	1	100.0	0.0				
	7	2	8	0	10	100.0	0.0	0.0	62.5	37.5	0.0
15 May	8	2	2	0	4	100.0	0.0	0.0	0.0	100.0	0.0
	9	6	9	0	15	100.0	0.0	0.0	33.3	66.7	0.0
	10	11	11	0	22	100.0	0.0	9.1	54.5	36.4	0.0
	11	5	4	0	9	100.0	0.0	0.0	33.3	66.7	0.0
	12										
	13										
	14										
	15										
Sample Total		27	34	0	61	100.0	0.0	3.0	45.5	51.5	0.0
	1										
	2										
	3										
	4										
	5	1	0	0	1	100.0	0.0				
	6										
	7	1	4	0	5	100.0	0.0	0.0	0.0	100.0	0.0
16 May	8	0	1	0	1			0.0	0.0	100.0	0.0
	9	5	2	0	7	100.0	0.0	0.0	0.0	100.0	0.0
	10	5	5	0	10	100.0	0.0	0.0	0.0	100.0	0.0
	11	2	0	0	2	100.0	0.0				
	12										
	13										
	14										
	15										
Sample Total		14	12	0	26	100.0	0.0	0.0	0.0	100.0	0.0

– continued –

Appendix B.19. (Page 5 of 5).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5	0	1	0	1			0.0	0.0	100.0	0.0
	6	0	1	0	1			0.0	0.0	100.0	0.0
	7	2	7	0	9	100.0	0.0	0.0	0.0	85.7	14.3
21 May	8	2	1	0	3	50.0	50.0	0.0	0.0	100.0	0.0
	9	5	5	0	10	80.0	20.0	0.0	0.0	100.0	0.0
	10	12	17	0	29	41.7	58.3	0.0	0.0	52.9	47.1
	11	6	2	0	8	33.3	66.7	0.0	0.0	50.0	50.0
	12										
	13										
	14										
	15										
Sample Total		27	34	0	61	51.9	48.1	0.0	0.0	70.6	29.4
	1										
	2										
	3										
	4	0	1	0	1			0.0	0.0	100.0	0.0
	5	5	5	0	10	100.0	0.0	0.0	20.0	80.0	0.0
	6	6	11	0	17	100.0	0.0	0.0	27.3	72.7	0.0
	7	32	49	0	81	100.0	0.0	0.0	24.5	73.5	2.0
4–21 May	8	31	24	0	55	96.8	3.2	0.0	20.8	79.2	0.0
	9	56	43	0	99	98.2	1.8	0.0	20.9	79.1	0.0
	10	58	60	0	118	87.9	12.1	1.7	23.3	61.7	13.3
	11	16	9	0	25	75.0	25.0	0.0	25.0	62.5	12.5
	12	1	2	0	3	100.0	0.0	0.0	50.0	50.0	0.0
	13										
	14										
	15										
All Samples		205	204	0	409	93.6	6.4	0.5	23.2	71.4	4.9

Appendix B.20. Sexual maturity of Pacific herring caught by test variable-mesh gillnet, Kulukak Section, 1–25 May 1988.

		Sex (number)				Gonad Maturity (%)					
						Male		Female			
Sample Dates	Age	Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
1 May	1										
	2										
	3										
	4										
	5										
	6										
	7	2	0	0	2	100.0	0.0				
	8										
	9										
	10										
	11										
	12										
	13										
	14										
	15										
Sample Total		2	0	0	2	100.0	0.0				
4 May	1										
	2										
	3										
	4										
	5	1	2	0	3	100.0	0.0	0.0	50.0	50.0	0.0
	6	1	0	0	1	100.0	0.0				
	7	5	1	0	6	100.0	0.0	0.0	100.0	0.0	0.0
	8	2	1	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	9	2	3	0	5	100.0	0.0	0.0	0.0	100.0	0.0
	10	3	3	0	6	100.0	0.0	0.0	33.3	66.7	0.0
	11	1	0	0	1	100.0	0.0				
	12										
	13										
	14										
	15										
Sample Total		15	10	0	25	100.0	0.0	0.0	30.0	70.0	0.0
5 May	1										
	2										
	3										
	4										
	5	2	0	0	2	100.0	0.0				
	6										
	7										
	8	1	0	0	1	100.0	0.0				
	9	1	1	0	2	100.0	0.0	0.0	0.0	100.0	0.0
	10										
	11										
	12										
	13										
	14										
	15										
Sample Total		4	1	0	5	100.0	0.0	0.0	0.0	100.0	0.0

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Appendix B.20. (Page 2 of 6).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5										
	6	0	1	0	1			0.0	0.0	100.0	0.0
	7										
6 May	8										
	9										
	10										
	11	1	0	0	1	100.0	0.0				
	12										
	13	1	0	0	1	100.0	0.0				
	14										
	15										
Sample Total		2	1	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	1										
	2										
	3										
	4										
	5										
	6										
	7										
8 May	8	0	2	0	2			0.0	50.0	50.0	0.0
	9										
	10										
	11										
	12										
	13										
	14										
	15										
Sample Total		0	2	0	2			0.0	50.0	50.0	0.0
	1										
	2										
	3										
	4										
	5	2	0	0	2	100.0	0.0				
	6	1	0	0	1	100.0	0.0				
	7	4	1	0	5	100.0	0.0	0.0	0.0	100.0	0.0
9 May	8	0	1	0	1			0.0	0.0	100.0	0.0
	9	0	1	0	1			0.0	0.0	100.0	0.0
	10										
	11										
	12										
	13										
	14										
	15										
Sample Total		7	3	0	10	100.0	0.0	0.0	0.0	100.0	0.0

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Appendix B.20. (Page 3 of 6).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4	2	2	0	4	100.0	0.0	0.0	0.0	100.0	0.0
	5	12	5	0	17	100.0	0.0	0.0	20.0	80.0	0.0
	6	0	2	0	2			0.0	0.0	100.0	0.0
	7	4	6	0	10	100.0	0.0	0.0	16.7	83.3	0.0
11 May	8	3	7	0	10	100.0	0.0	0.0	0.0	100.0	0.0
	9	0	3	0	3			0.0	33.3	66.7	0.0
	10	2	2	0	4	100.0	0.0	0.0	0.0	100.0	0.0
	11	1	0	0	1	100.0	0.0				
	12										
	13										
	14										
	15										
Sample Total		24	27	0	51	100.0	0.0	0.0	11.1	88.9	0.0
	1										
	2										
	3	1	0	0	1	100.0	0.0				
	4	7	4	0	11	100.0	0.0	0.0	100.0	0.0	0.0
	5	5	11	0	16	100.0	0.0	0.0	27.3	72.7	0.0
	6	1	0	0	1	100.0	0.0				
	7	0	8	0	8			0.0	50.0	50.0	0.0
12 May	8	1	3	0	4	100.0	0.0	0.0	0.0	100.0	0.0
	9	1	0	0	1	100.0	0.0				
	10	2	1	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	11	0	1	0	1			0.0	0.0	100.0	0.0
	12										
	13										
	14										
	15										
Sample Total		18	28	0	46	100.0	0.0	0.0	39.3	60.7	0.0
	1										
	2										
	3										
	4										
	5										
	6										
	7	1	0	0	1	100.0	0.0				
13 May	8										
	9	2	1	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	10										
	11										
	12										
	13										
	14										
	15										
Sample Total		3	1	0	4	100.0	0.0	0.0	0.0	100.0	0.0

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Appendix B.20. (Page 4 of 6).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4	0	1	0	1			0.0	0.0	100.0	0.0
	5	0	1	0	1			0.0	0.0	100.0	0.0
	6	1	0	0	1	100.0	0.0				
	7	0	2	0	2			0.0	0.0	100.0	0.0
14 May	8	1	0	0	1	100.0	0.0				
	9										
	10	0	1	0	1			0.0	0.0	100.0	0.0
	11										
	12										
	13										
	14										
	15										
Sample Total		2	5	0	7	100.0	0.0	0.0	0.0	100.0	0.0
	1										
	2										
	3										
	4	0	1	0	1			0.0	0.0	100.0	0.0
	5	5	1	0	6	100.0	0.0	0.0	0.0	100.0	0.0
	6	0	2	0	2			0.0	0.0	100.0	0.0
	7	8	6	0	14	100.0	0.0	0.0	0.0	100.0	0.0
15 May	8	1	2	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	9	6	5	0	11	100.0	0.0	0.0	0.0	100.0	0.0
	10	10	7	0	17	100.0	0.0	0.0	14.3	85.7	0.0
	11	3	2	0	5	100.0	0.0	0.0	0.0	100.0	0.0
	12	2	0	0	2	100.0	0.0				
	13										
	14										
	15										
Sample Total		35	26	0	61	100.0	0.0	0.0	4.0	96.0	0.0
	1										
	2										
	3										
	4	1	0	0	1	100.0	0.0				
	5	6	6	0	12	100.0	0.0	0.0	0.0	100.0	0.0
	6	2	0	0	2	100.0	0.0				
	7	3	8	0	11	100.0	0.0	0.0	0.0	100.0	0.0
18 May	8	7	4	0	11	100.0	0.0	0.0	0.0	100.0	0.0
	9	7	10	0	17	100.0	0.0	0.0	0.0	100.0	0.0
	10	9	12	0	21	100.0	0.0	0.0	0.0	100.0	0.0
	11	2	2	0	4	100.0	0.0	0.0	0.0	100.0	0.0
	12	0	1	0	1			0.0	0.0	100.0	0.0
	13										
	14										
	15										
Sample Total		37	43	0	80	100.0	0.0	0.0	0.0	100.0	0.0

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Appendix B.20. (Page 5 of 6).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
19 May	1										
	2										
	3										
	4	2	1	0	3	100.0	0.0	0.0	100.0	0.0	0.0
	5	8	3	0	11	87.5	12.5	0.0	0.0	100.0	0.0
	6	3	0	0	3	100.0	0.0				
	7	9	4	0	13	55.6	44.4	0.0	0.0	50.0	50.0
	8	7	2	0	9	100.0	0.0	0.0	0.0	100.0	0.0
	9	15	11	0	26	73.3	26.7	0.0	0.0	63.6	36.4
	10	24	29	0	53	83.3	16.7	0.0	0.0	55.2	44.8
	11	4	8	0	12	75.0	25.0	0.0	0.0	50.0	50.0
	12	1	0	0	1	0.0	100.0				
	13										
	14										
	15										
Sample Total		73	58	0	131	79.5	20.5	0.0	1.7	58.6	39.7
22 May	1										
	2										
	3	1	0	0	1	100.0	0.0				
	4	35	26	0	61	100.0	0.0	0.0	0.0	100.0	0.0
	5	34	30	0	64	100.0	0.0	0.0	0.0	100.0	0.0
	6	6	5	0	11	83.3	6.7	0.0	0.0	100.0	0.0
	7	9	7	0	16	88.9	11.1	0.0	0.0	100.0	0.0
	8	4	1	0	5	100.0	0.0	0.0	0.0	100.0	0.0
	9	12	2	0	14	91.7	8.3	0.0	0.0	100.0	0.0
	10	11	5	0	16	100.0	0.0	0.0	0.0	80.0	20.0
	11	3	1	0	4	100.0	0.0	0.0	0.0	100.0	0.0
	12	0	1	0	1			0.0	0.0	100.0	0.0
	13										
	14										
	15										
Sample Total		115	78	0	193	97.4	2.6	0.0	0.0	98.7	1.3
23 May	1										
	2										
	3	1	0	0	1	100.0	0.0				
	4	9	11	0	20	100.0	0.0	0.0	0.0	100.0	0.0
	5	33	31	0	64	100.0	0.0	0.0	0.0	100.0	0.0
	6	1	2	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	7	12	11	0	23	100.0	0.0	0.0	0.0	100.0	0.0
	8	7	3	0	10	100.0	0.0	0.0	0.0	100.0	0.0
	9	6	6	0	12	100.0	0.0	0.0	0.0	83.3	16.7
	10	4	3	0	7	100.0	0.0	0.0	0.0	100.0	0.0
	11	1	0	0	1	100.0	0.0				
	12										
	13										
	14										
	15										
Sample Total		74	67	0	141	100.0	0.0	0.0	0.0	98.5	1.5

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Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4	5	11	0	16	100.0	0.0	0.0	0.0	100.0	0.0
	5	6	9	0	15	100.0	0.0	0.0	0.0	100.0	0.0
	6	0	1	0	1			0.0	0.0	100.0	0.0
	7	0	1	0	1			0.0	0.0	100.0	0.0
25 May	8	0	1	0	1			0.0	0.0	100.0	0.0
	9	2	0	0	2	100.0	0.0				
	10	1	2	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	11										
	12										
	13										
	14										
	15										
Sample Total		14	25	0	39	100.0	0.0	0.0	0.0	100.0	0.0
	1										
	2										
	3	3	0	0	3	100.0	0.0				
	4	61	57	0	118	100.0	0.0	0.0	8.9	91.1	0.0
	5	114	99	0	213	99.1	0.9	0.0	5.1	94.9	0.0
	6	16	13	0	29	93.8	6.3	0.0	0.0	100.0	0.0
	7	57	55	0	112	91.2	8.8	0.0	11.1	85.2	3.7
1–25 May	8	34	27	0	61	100.0	0.0	0.0	3.7	96.3	0.0
	9	54	43	0	97	90.7	9.3	0.0	2.3	86.0	11.6
	10	66	65	0	131	93.9	6.1	0.0	3.1	75.4	21.5
	11	16	14	0	30	93.8	6.3	0.0	0.0	71.4	28.6
	12	3	2	0	5	66.7	3.3	0.0	0.0	100.0	0.0
	13	1	0	0	1	100.0	0.0				
	14										
	15										
All Samples		425	375	0	800	95.8	4.2	0.0	5.4	87.9	6.7

Appendix B.21. Sexual maturity of Pacific herring caught by test variable-mesh gillnet, Nunavachak Section, 22–23 May 1988.

		Sex (number)				Gonad Maturity (%)					
						Male		Female			
Sample Dates	Age	Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4	5	5	0	10	80.0	20.0	0.0	0.0	100.0	0.0
	5	13	17	0	30	100.0	0.0	0.0	0.0	100.0	0.0
	6	2	5	0	7	100.0	0.0	0.0	0.0	80.0	20.0
	7	14	12	0	26	78.6	21.4	0.0	0.0	100.0	0.0
22 May	8	4	3	0	7	75.0	25.0	0.0	0.0	100.0	0.0
	9	6	3	0	9	83.3	16.7	0.0	0.0	66.7	33.3
	10	6	3	0	9	83.3	16.7	0.0	0.0	0.0	100.0
	11	3	2	0	5	66.7	33.3	0.0	0.0	100.0	0.0
	12										
	13										
	14										
	15										
Sample Total		53	50	0	103	84.9	15.1	0.0	0.0	90.0	10.0
	1										
	2										
	3										
	4	2	1	0	3	50.0	50.0	0.0	0.0	100.0	0.0
	5	5	8	0	13	80.0	20.0	0.0	0.0	50.0	50.0
	6	1	1	0	2	100.0	0.0	0.0	0.0	0.0	100.0
	7	11	5	0	16	72.7	27.3	0.0	0.0	60.0	40.0
23 May	8	0	2	0	2			0.0	0.0	100.0	0.0
	9	3	1	0	4	33.3	66.7	0.0	0.0	0.0	100.0
	10	4	2	0	6	50.0	50.0	0.0	0.0	0.0	100.0
	11	3	1	0	4	66.7	33.3	0.0	0.0	0.0	100.0
	12										
	13										
	14										
	15										
Sample Total		29	21	0	50	65.5	35.0	0.0	0.0	47.6	52.4
	1										
	2										
	3										
	4	7	6	0	13	71.4	28.6	0.0	0.0	100.0	0.0
	5	18	25	0	43	94.4	5.6	0.0	0.0	84.0	16.0
	6	3	6	0	9	100.0	0.0	0.0	0.0	66.7	33.3
	7	25	17	0	42	76.0	24.0	0.0	0.0	88.2	11.8
22–23 May	8	4	5	0	9	75.0	25.0	0.0	0.0	100.0	0.0
	9	9	4	0	13	66.7	33.3	0.0	0.0	50.0	50.0
	10	10	5	0	15	70.0	30.0	0.0	0.0	0.0	100.0
	11	6	3	0	9	66.7	33.3	0.0	0.0	66.7	33.3
	12										
	13										
	14										
	15										
All Samples		82	71	0	153	78.0	21.9	0.0	0.0	77.5	22.5

Appendix B.22. Sexual maturity of Pacific herring caught by test variable-mesh gillnet, Hagemeister Section, 4–12 May 1988.

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
4 May	1										
	2										
	3										
	4										
	5	0	1	0	1			0.0	100.0	0.0	0.0
	6	0	1	0	1			0.0	0.0	100.0	0.0
	7	2	3	0	5	100.0	0.0	0.0	0.0	100.0	0.0
	8										
	9	2	0	0	2	100.0	0.0				
	10										
	11										
	12										
	13										
	14										
	15										
Sample Total		6	5	0	11	100.0	0.0	0.0	20.0	80.0	0.0
5 May	1										
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9	1	0	0	1	100.0	0.0				
	10										
	11										
	12										
	13										
	14										
	15										
Sample Total		1	0	0	1	100.0	0.0				
6 May	1										
	2										
	3										
	4										
	5										
	6										
	7										
	8	0	1	0	1			0.0	100.0	0.0	0.0
	9										
	10										
	11	1	0	0	1	100.0	0.0				
	12										
	13										
	14										
	15										
Sample Total		1	1	0	2	100.0	0.0	0.0	100.0	0.0	0.0

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Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
12 May	1										
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9										
	10										
	11										
	12	1	1	0	2	100.0	0.0	0.0	100.0	0.0	0.0
	13										
	14										
	15										
Sample Total		1	1	0	2	100.0	0.0	0.0	100.0	0.0	0.0
4–12 May	1										
	2										
	3										
	4										
	5										
	6	0	1	0	1			0.0	100.0	0.0	0.0
	7	0	1	0	1			0.0	0.0	100.0	0.0
	8	1	1	0	2			0.0	100.0	0.0	0.0
	9	3	3	0	6	100.0	0.0	0.0	0.0	100.0	0.0
	10										
	11	3	0	0	3	100.0	0.0				
	12	1	1	0	2	100.0	0.0	0.0	100.0	0.0	0.0
	13										
	14										
	15										
All Samples		9	7	0	16	100.0	0.0	0.0	42.9	57.1	0.0

Appendix B.23. Sexual maturity of Pacific herring caught by test variable-mesh gillnet, Kulukak, Nunavachak, and Hagemeister Sections combined, 1–25 May 1988.

		Sex (number)				Gonad Maturity (%)					
						Male		Female			
Sample Dates	Age	Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5										
	6										
	7	2	0	0	2	100.0	0.0				
1 May	8										
	9										
	10										
	11										
	12										
	13										
	14										
	15										
Sample Total		2	0	0	2	100.0	0.0				
	1										
	2										
	3										
	4										
	5	1	3	0	4	100.0	0.0	0.0	66.7	33.3	0.0
	6	1	1	0	2	100.0	0.0	0.0	0.0	100.0	0.0
	7	6	1	0	7	100.0	0.0	0.0	100.0	0.0	0.0
4 May	8	3	1	0	4	100.0	0.0	0.0	0.0	100.0	0.0
	9	4	6	0	10	100.0	0.0	0.0	0.0	100.0	0.0
	10	3	3	0	6	100.0	0.0	0.0	33.3	66.7	0.0
	11	3	0	0	3	100.0	0.0				
	12										
	13										
	14										
	15										
Sample Total		21	15	0	36	100.0	0.0	0.0	26.7	73.3	0.0
	1										
	2										
	3										
	4										
	5	2	0	0	2	100.0	0.0				
	6										
	7										
5 May	8	1	0	0	1	100.0	0.0				
	9	2	1	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	10										
	11										
	12										
	13										
	14										
	15										
Sample Total		5	1	0	6	100.0	0.0	0.0	0.0	100.0	0.0

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Appendix B.23. (Page 2 of 6).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4										
	5										
	6	0	1	0	1			0.0	0.0	100.0	0.0
	7										
6 May	8	0	1	0	1			0.0	100.0	0.0	0.0
	9										
	10										
	11	2	0	0	2	100.0	0.0				
	12										
	13	1	0	0	1	100.0	0.0				
	14										
	15										
Sample Total		3	2	0	5	100.0	0.0	0.0	50.0	50.0	0.0
	1										
	2										
	3										
	4										
	5										
	6										
	7										
8 May	8	0	2	0	2			0.0	50.0	50.0	0.0
	9										
	10										
	11										
	12										
	13										
	14										
	15										
Sample Total		0	2	0	2			0.0	50.0	50.0	0.0
	1										
	2										
	3										
	4										
	5	2	0	0	2	100.0	0.0				
	6	1	0	0	1	100.0	0.0				
	7	4	1	0	5	100.0	0.0	0.0	0.0	100.0	0.0
9 May	8	0	1	0	1			0.0	0.0	100.0	0.0
	9	0	1	0	1			0.0	0.0	100.0	0.0
	10										
	11										
	12										
	13										
	14										
	15										
Sample Total		7	3	0	10	100.0		0.0	0.0	100.0	0.0

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Appendix B.23. (Page 3 of 6).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4	2	2	0	4	100.0	0.0	0.0	0.0	100.0	0.0
	5	12	5	0	17	100.0	0.0	0.0	20.0	80.0	0.0
	6	0	2	0	2			0.0	0.0	100.0	0.0
	7	4	6	0	10	100.0	0.0	0.0	16.7	83.3	0.0
11 May	8	3	7	0	10	100.0	0.0	0.0	0.0	100.0	0.0
	9	0	3	0	3			0.0	33.3	66.7	0.0
	10	2	2	0	4	100.0	0.0	0.0	0.0	100.0	0.0
	11	1	0	0	1	100.0	0.0				
	12										
	13										
	14										
	15										
Sample Total		24	27	0	51	100.0	0.0	0.0	11.1	88.9	0.0
	1										
	2										
	3	1	0	0	1	100.0	0.0				
	4	7	4	0	11	100.0	0.0	0.0	100.0	0.0	0.0
	5	5	11	0	16	100.0	0.0	0.0	27.3	72.7	0.0
	6	1	0	0	1	100.0	0.0				
	7	0	8	0	8			0.0	50.0	50.0	0.0
12 May	8	1	3	0	4	100.0	0.0	0.0	0.0	100.0	0.0
	9	1	0	0	1	100.0	0.0				
	10	2	1	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	11	0	1	0	1			0.0	0.0	100.0	0.0
	12	1	1	0	2	100.0	0.0	0.0	100.0	0.0	0.0
	13										
	14										
	15										
Sample Total		19	29	0	48	100.0	0.0	0.0	41.4	58.6	0.0
	1										
	2										
	3										
	4										
	5										
	6										
	7	1	0	0	1	100.0	0.0				
13 May	8										
	9	2	1	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	10										
	11										
	12										
	13										
	14										
	15										
Sample Total		3	1	0	4	100.0	0.0	0.0	0.0	100.0	0.0

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Appendix B.23. (Page 4 of 6).

Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4	0	1	0	1			0.0	0.0	100.0	0.0
	5	0	1	0	1			0.0	0.0	100.0	0.0
	6	1	0	0	1	100.0	0.0				
	7	0	2	0	2			0.0	0.0	100.0	0.0
14 May	8	1	0	0	1	100.0	0.0				
	9										
	10	0	1	0	1			0.0	0.0	100.0	0.0
	11										
	12										
	13										
	14										
	15										
Sample Total		2	5	0	7	100.0	0.0	0.0	0.0	100.0	0.0
	1										
	2										
	3										
	4	0	1	0	1			0.0	0.0	100.0	0.0
	5	5	1	0	6	100.0	0.0	0.0	0.0	100.0	0.0
	6	0	2	0	2			0.0	0.0	100.0	0.0
	7	8	6	0	14	100.0	0.0	0.0	0.0	100.0	0.0
15 May	8	1	2	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	9	6	5	0	11	100.0	0.0	0.0	0.0	100.0	0.0
	10	10	7	0	17	100.0	0.0	0.0	14.3	85.7	0.0
	11	3	2	0	5	100.0	0.0	0.0	0.0	100.0	0.0
	12	2	0	0	2	100.0	0.0				
	13										
	14										
	15										
Sample Total		35	26	0	61	100.0	0.0	0.0	4.0	96.0	0.0
	1										
	2										
	3										
	4	1	0	0	1	100.0	0.0				
	5	6	6	0	12	100.0	0.0	0.0	0.0	100.0	0.0
	6	2	0	0	2	100.0	0.0				
	7	3	8	0	11	100.0	0.0	0.0	0.0	100.0	0.0
18 May	8	7	4	0	11	100.0	0.0	0.0	0.0	100.0	0.0
	9	7	10	0	17	100.0	0.0	0.0	0.0	100.0	0.0
	10	9	12	0	21	100.0	0.0	0.0	0.0	100.0	0.0
	11	2	2	0	4	100.0	0.0	0.0	0.0	100.0	0.0
	12	0	1	0	1			0.0	0.0	100.0	0.0
	13										
	14										
	15										
Sample Total		37	43	0	80	100.0	0.0	0.0	0.0	100.0	0.0

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Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4	2	1	0	3	100.0	0.0	0.0	100.0	0.0	0.0
	5	8	3	0	11	87.5	12.5	0.0	0.0	100.0	0.0
	6	3	0	0	3	100.0	0.0				
	7	9	4	0	13	55.6	44.4	0.0	0.0	50.0	50.0
19 May	8	7	2	0	9	100.0	0.0	0.0	0.0	100.0	0.0
	9	15	11	0	26	73.3	26.7	0.0	0.0	63.6	36.4
	10	24	29	0	53	83.3	16.7	0.0	0.0	55.2	44.8
	11	4	8	0	12	75.0	25.0	0.0	0.0	50.0	50.0
	12	1	0	0	1	0.0	100.0				
	13										
	14										
	15										
Sample Total		73	58	0	131	79.5	20.5	0.0	1.7	58.6	39.7
	1										
	2										
	3	1	0	0	1	100.0	0.0				
	4	40	31	0	71	97.5	2.5	0.0	0.0	100.0	0.0
	5	47	47	0	94	100.0	0.0	0.0	0.0	100.0	0.0
	6	8	10	0	18	87.5	12.5	0.0	0.0	90.0	10.0
	7	23	19	0	42	82.6	17.4	0.0	0.0	100.0	0.0
22 May	8	8	4	0	12	87.5	12.5	0.0	0.0	100.0	0.0
	9	18	5	0	23	88.9	11.1	0.0	0.0	80.0	20.0
	10	17	8	0	25	94.1	5.9	0.0	0.0	50.0	50.0
	11	6	3	0	9	83.3	16.7	0.0	0.0	100.0	0.0
	12	0	1	0	1			0.0	0.0	100.0	0.0
	13										
	14										
	15										
Sample Total		168	128	0	296	93.5	6.5	0.0	0.0	95.3	4.7
	1										
	2										
	3	1	0	0	1	100.0	0.0				
	4	11	12	0	23	90.9	9.1	0.0	0.0	100.0	0.0
	5	38	39	0	77	97.4	2.6	0.0	0.0	89.7	10.3
	6	2	3	0	5	100.0	0.0	0.0	0.0	66.7	33.3
	7	23	16	0	39	87.0	13.0	0.0	0.0	87.5	12.5
23 May	8	7	5	0	12	100.0	0.0	0.0	0.0	100.0	0.0
	9	9	7	0	16	77.8	22.2	0.0	0.0	71.4	28.6
	10	8	5	0	13	75.0	25.0	0.0	0.0	60.0	40.0
	11	4	1	0	5	75.0	25.0	0.0	0.0	0.0	100.0
	12										
	13										
	14										
	15										
Sample Total		103	88	0	191	90.3	9.7	0.0	0.0	86.2	13.8

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Sample Dates	Age	Sex (number)				Gonad Maturity (%)					
						Male		Female			
		Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4	5	11	0	16	100.0	0.0	0.0	0.0	100.0	0.0
	5	6	9	0	15	100.0	0.0	0.0	0.0	100.0	0.0
	6	0	1	0	1			0.0	0.0	100.0	0.0
	7	0	1	0	1			0.0	0.0	100.0	0.0
25 May	8	0	1	0	1			0.0	0.0	100.0	0.0
	9	2	0	0	2	100.0	0.0				
	10	1	2	0	3	100.0	0.0	0.0	0.0	100.0	0.0
	11										
	12										
	13										
	14										
	15										
Sample Total		14	25	0	39	100.0	0.0	0.0	0.0	100.0	0.0
	1										
	2										
	3	3	0	0	3	100.0	0.0				
	4	68	63	0	131	97.1	3.0	0.0	8.1	91.9	0.0
	5	132	125	0	257	98.5	1.5	0.0	4.8	92.0	3.2
	6	19	20	0	39	94.7	5.3	0.0	0.0	90.0	10.0
	7	83	72	0	155	86.6	13.4	0.0	8.5	85.9	5.6
1–25 May	8	39	33	0	72	97.4	2.6	0.0	6.1	93.9	0.0
	9	66	50	0	116	87.9	12.1	0.0	2.0	84.0	14.0
	10	76	70	0	146	90.8	9.2	0.0	2.9	70.0	27.1
	11	25	17	0	42	87.5	12.5	0.0	0.0	70.6	29.4
	12	4	3	0	7	75.0	25.0	0.0	33.3	66.7	0.0
	13	1	0	0	1	100.0	0.0				
	14										
	15										
All Samples		516	453	0	969	93.0	7.0	0.0	5.1	85.8	9.1

Appendix B.24. Sexual maturity of Pacific herring caught by dip net, Nunavachak Section, 23 May 1988.

		Sex (number)				Gonad Maturity (%)					
						Male		Female			
Sample Dates	Age	Male	Female	Unknown	Total	Ripe	Spent	Unknown	Green	Ripe	Spent
	1										
	2										
	3										
	4	3	6	0	9	100.0	0.0	0.0	0.0	50.0	50.0
	5	7	8	0	15	71.4	28.6	0.0	0.0	50.0	50.0
	6	1	0	0	1	100.0	0.0				
	7	1	4	0	5	100.0	0.0	0.0	0.0	100.0	0.0
23 May	8	1	0	0	1	100.0	0.0				
	9	0	2	0	2			0.0	0.0	50.0	50.0
	10	1	3	0	4	100.0	0.0	0.0	0.0	33.3	66.7
	11	1	2	0	3	100.0	0.0	0.0	0.0	50.0	50.0
	12										
	13										
	14										
	15										
Sample Total		15	25	0	40	86.7	13.3	0.0	0.0	56.0	44.0

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